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THE UNIVERSITY OF ALBERTA

SOCIAL, ECONOMIC AND PSYCHOLOGICAL FACTORS IN DECISIONS OF ALBERTA FARMERS

by

CAROL ANNE MOERTH

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF SCIENCE

IN

RURAL SOCIOLOGY

DEPARTMENT OF RURAL ECONOMY

EDMONTON, ALBERTA

FALL, 1990

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ISBN 0-315-64963-1

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Abstract

A central role of the farm operator, and one that determines the ability of the operation to cope with uncertainty, is the making of decisions. The role of the farm decision maker is especially important in conditions of instability such as is currently being experienced by farmers in Alberta as a result of market prices, government policy on agriculture, and the economic climate in Alberta, in general. In such a climate of uncertainty, it is important to recognize and understand all of the factors which influence decision making of farm operators, to be better able to provide appropriate assistance to them in the management of their farms.

The purpose of this study was to analyze the impact of economic, social and psychological factors on the decision-making process of farm operators. Specifically, the study considers the decision-making process and examines the relationship that exists between the extent of 'managerial considerations' exhibited in the decision-making process and the personal orientation of farm operators.

In order to understand the relationships between personal characteristics of the farm firm and operator, personal orientation and managerial considerations, a quantitative analysis was undertaken. Data used in the analysis was collected through a questionnaire mailed out to farm households in Alberta Agriculture's Northwest Region. Information on personal and farm firm characteristics were gathered. In addition, scales of personal orientation, managerial consideration, risk preference and organizational involvement were constructed through a series of questions in each area.

A frequent assumption made in farm management studies is that 'noneconomic' and 'economic' goals are somehow in opposition. A farm operator is considered to have either a business or a social orientation. As the study developed, it became apparent that these orientations are not in opposition, but rather are complementary parts of the larger value orientation of the individual. The results indicated that farm operators with a personal orientation score which consisted of high levels of *both* business and social orientations exhibited more managerial considerations in their decision making than did those with a personal orientation which consisted of low levels of business and social orientations.

ACKNOWLEDGEMENTS

I thank my parents, Avis and Rupert, for their unfailing belief, even when I lacked it myself, in my abilities to tackle any project I have undertaken in my entire life.

I thank my advisor, Dr. Dhara Gill, for the invaluable lessons on learning and life in general. It was through his guidance that I learned to trust my own abilities and that the scope of what I can learn is as broad as the horizon.

I thank Farming For the Future for the funding for my project, for without their interest, this project would not be possible.

I owe a great deal of thanks to the many staff at Alberta Agriculture who provided me with assistance and encouragement. Specifically, Bob Winchell, Gerald Laarhuis, Jean Wilson, Charles Sterling and Faye Douglas Phillips. In addition I must thank George Andrusiak, with Statistics Canada.

Additional thanks go to Norah Keating, Len Bauer, Bill Phillips, Vic Adamowicz, Jim Copeland, Claire Shier, Judy Boucher, Wendy Williamson, Barb Johnson and Hildegard Ziegler.

To my many fellow students and office mates, thanks for sharing the load and providing the sanity breaks which are so necessary for survival.

To my husband, Arnold, thank you for being there when I needed you the most.

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1. INTRODUCTION

Background to the Problem

The business of farming is one dominated by uncertainty. There are many factors which are beyond the control of the farm operator that have a tremendous influence on the daily management of the farm. The very nature of the agriculture industry, in which the revenue that is received by Alberta farmers for their produce is governed by the intricate workings of national and international markets, is a source of uncertainty. The individual farm operator is powerless to affect international, political, economic and social activity which can influence the behavior of the market. An additional source of uncertainty which faces farmers in Alberta is the weather. For example, early or late frosts can kill young plants and animals and hamper harvesting. Hail can ruin a complete crop within minutes. High winds can cause rapid depletion of top soil. An excess or deficit of precipitation can affect crop growth and the ability to harvest it. In addition, gradually changing climate, the availability of resources, and changeable government policy such as free trade or the general sales tax, all are sources of significant uncertainty to the farm operator. This tremendous uncertainty associated with the occupation of farming, makes it a risky occupation, and necessitates that the farm operator be an effective manager to be able to adjust to the uncertain elements and act on the certain elements.

A central role of the farm operator, and one that determines the ability of the operation to cope with uncertainty, is the making of decisions. The situations which necessitate decisions on the farm are complicated by the dual nature of the farm household which encompasses two separate, yet inextricably linked, entities: the farm firm and the farm family. Farm decision makers must consider the multitude of complex factors which have an impact on both of these entities. In addition, the decision makers must also contemplate the needs of both the farm firm and the farm family, which are often in competition with each other for scarce resources.

The role of a farm decision maker is especially important in conditions of instability such as is currently being experienced by farmers in Alberta as a result of market prices, changing government policy on agriculture and the economic climate in Alberta in general. The farm operator who is faced

with making an important financial decision in such a time of economic instability, and who does not consider the relevant factors, is more likely to experience financial stress than he/she would in a more stable time.

The Problem

There are vast quantities of literature published by government and university research groups that assist farm managers in making their decisions. A large number of these publications address their writings to the farmer who is motivated primarily by business goals. This farm manager, or 'business farmer', views the farm as a business enterprise and makes his/her decisions according to rigid business principles. The concept of farming as a business is supported by a cursory inspection of university texts and magazines on farm management which define their subject area almost entirely with business terms.

A stereotype of the opposite extreme from the 'business farmer' is the 'life-style farmer' to whom farming is a way of life. This 'life-style farmer' enjoys farming because it is a hard working occupation, and the farming life is viewed as being more natural, 'down-to -earth', than city life.[1] Factors, other than principles of business, such as family considerations, personal values, and other psychological and social factors, influence decision-making. This 'life-style farmer' is viewed as having a comparatively 'social' orientation.

However, these stereotypes are not supported by real observation. Decisions which don't appear to be based solely on economic criteria are frequently made by 'business farmers'. These decisions appear to be influenced by goals other than that of maximization of financial earnings. Likewise, the farmer with the social orientation doesn't appear to be singularly motivated by purely 'lifestyle' criteria. Yet, there appear to be unique strategies employed in the decision making of different farm operators. To better understand the basis for different types of farm decision-making strategies, there is a need for research which will consider alternative personal orientations to farm management and how these orientations influence farm decision-making.

Decision-making on the farm should not be viewed as being undertaken by business farm operators who are influenced solely by economic factors and, as a consequence, act as purely rational business farmers. Similarly, the social farmer cannot be viewed as being motivated purely by seemingly 'non-economic' criteria. Instead, there are many factors which simultaneously influence farm operators, and this combination of factors affects the outcome of the decision-making process.

The purpose of this study is to analyze the impact of economic, social and psychological factors on the decision-making process of farm operators. Specifically, the study will consider the decision-making process and examine the relationship that exists between the extent of 'managerial considerations' exhibited in the decision-making process and the personal orientation of farm operators.

The Importance of the Study

This study will benefit both agricultural extension workers and farm operators by distinguishing the key social, psychological and economic factors which influence the decision-making process of farm managers. The identification of social, psychological and economic factors which influence decision makers and knowledge of the degree to which they influence management decisions will assist Alberta Agriculture in the design and delivery of extension programs to farm operators.

The 1983 document, Information Needs of Alberta Farmers and Farm Families, established that there was a need for development of effective communication linkage systems between extension workers and farm operators.[2] The study identified an under utilization of extension programs offered by Alberta Agriculture. The cause of this problem was identified to be a lack of communication between farmers, extension workers and universities.[3] One reason for the lack of communication may be a lack of understanding of the needs and interests of farm operators. This study will provide an improved understanding of the factors that are important to farm operators as they make their farm management decisions.

Knowledge of both the social and business factors which influence the decision-making of farm operators will permit the extension worker to understand more fully the decision-making process and allow more effective communication to take place. Consequently, the extension programs can be tailored to assist farm operators in making decisions which consider the factors that will affect and be affected by the decision. During a period of economic instability, such as is currently being experienced by many farm operators, it is very important that farm managers consider all of the major factors involved in the farm management decision process. Also, given the likelihood that this instability may continue for some time, effective decision-making will continue to be a critical element of farm management. Additionally, Van Kooten, Schoney and Hayward indicate that "...understanding farmers' objectives can be useful for predicting economic behavior."[4]

Many farm operators are keenly interested in improving the efficiency of their operation. The establishment of relationships between value orientation, personal characteristics and managerial considerations exhibited during the decision-making process will assist these farm operators by illustrating the importance of consideration of their values and long range goals in their decisions. Hardaker and Anderson contend that farm record keeping systems should be designed to take into account goals of farm operators.[5] Establishing that goals and values are related to the amount of managerial considerations demonstrated when making decisions, and ultimately to the success or failure of their farm operation, will provide farm operators with tools for a thorough evaluation of their attitudes toward the management of their own farming operations.

The Objectives

The objectives of this study were to establish the relationship between a farm operator's personal and farm characteristics and his/her personal orientation and to establish the relationship between personal orientation and the extent to which managerial considerations occur in the process of making decisions.

Personal orientation refers to the combination of an individuals' goals and values that is derived from their unique personal characteristics and determines the manner in which they view the world. Personal orientation was measured by assigning a business and a social orientation score to each respondent based on responses to a series of goal statements. The goal statements were categorized as being either predominantly business or social in orientation. Four possible personal orientation combinations were established. The first possible combination is that the respondent scored high on both the business and the social orientation scales. The second possible orientation combination is that the respondent scored high on the business orientation scale and low on the social orientation scale. The third possible orientation combination is that the respondent scored low on the business orientation scale and high on the social orientation scale. The final combination occurs when a respondent scores low on both business and social orientation scales.

An initial assumption of this study was that the two personal orientations being studied, business and social, were somehow in opposition. A farm operator was considered to have either a business or a social orientation. As the study developed, it became apparent that these orientations are not in

opposition, but rather are complementary parts of the larger value orientation of the individual. It was important to incorporate the possibility that farm operators could score high or low in ***both*** business and social orientation scales.

The personal and farm firm characteristics which were considered to be related to personal orientation were the stage of the family life cycle, age, education, organization involvement, history of farming, income, farm size, amount of off-farm employment and risk tolerance. It was hypothesized that those respondents with a high level of business and social orientation would be at an earlier stage of the family life cycle, would be younger, have more education, less community organization involvement, more industry organization involvement, shorter history of farming, higher income, larger farm, larger amount of off-farm employment, greater risk tolerance, and would have inherited their farms.

The decision-making process is an complex and dynamic ***process*** and, consequently, it is difficult to evaluate empirically. For this reason, the decision-making process was studied by evaluating the amount and type of managerial considerations that the respondents employ at various stages in the process of making decisions. The score for managerial considerations was derived from a series of questions on the application of basic economic principles, record keeping and information searching behaviors. Based on the theory, it was expected that those farm operators with a high score on both business and social orientations would rank higher on the scale of managerial considerations in the decision-making process than those farmers who have other combinations of personal orientation.

The Research Process

In order to fulfill the objectives, the study was accomplished in four stages. The first stage consisted of consultation with staff from Alberta Agriculture and researchers from the University of Alberta. The second stage involved an in-depth analysis of the relevant literature. The third stage consisted of personal interviews with farm operators from Alberta Agriculture's Northwest Region. The fourth stage was the field study which involved collection and analysis of quantitative data to test the hypotheses.

The purpose of consulting staff from Alberta Agriculture was to enable the researcher to gain an understanding of the problem from the perspective of extension workers who interact with the farming community on a regular basis. A committee, consisting of staff from Alberta Agriculture and

researchers from the University of Alberta was established. Meetings with this committee were conducted at various times during the project to review the scope of the research and to provide feedback on the research process.

To enable the implementation of an effective field study, a research project requires a literature review to establish thorough knowledge of the field of interest, and an awareness and understanding of current research in the area of study. To develop the theoretical base of understanding of the research problem, the literature search examined the theoretical foundations of decision-making, farm management social values, action theory, organizational theory, and information theory. The review of current and previous studies of related problems was conducted in the fields of Rural Sociology, Family Studies, Farm Management, Agricultural Economics and Agricultural Geography. This review was conducted to assist in the design of the interview and the questionnaire.

The study of decision-making is impeded by the complexity and the dynamic nature of the process of making decisions, and as such is difficult to quantify. The personal interviews were performed to provide the researcher with a better understanding of both the process by which farm operators make decisions and to identify social, psychological and economic factors which influence the decision-making process. The interviews were conducted in August of 1988 with farm families from the region of study.

The purpose of the field study was to derive the quantitative data with which to empirically test the hypotheses. The instrument used to collect the data was a self-administered questionnaire which was mailed out to six hundred farm operators in the region of study. The data were analyzed using SPSSx and SPSS-PC.

Assumptions

In the development of the project, various assumptions were made about decision-making, the respondents, and the tools used in the study. The purpose of the study is to understand decision-making behavior. There was an assumption made that decision-making behavior varies with personal orientation. It was assumed that respondents with different personal orientations would exhibit differing amounts of managerial considerations in their decision-making process.

Another assumption was that decision-making behavior involves a conscious thought process and that respondents would be able to recall the process in some detail. Decision-making behavior was assumed to be observable and amenable to measurement by the survey instrument.

That decisions are discussed among family members was another assumption of the study. Related to this, it was assumed that the recipients of the questionnaire complied with the request on the cover letter that the survey be discussed and completed by all of the key decision makers on the farm.

Limitations of the Study

The strongest limitation of this study occurs as a result of concern over the ability to generalize the research results to the entire population. This limitation arises because of the concerns about the reliability and validity of the survey instrument that plague every researcher conducting a self-administered questionnaire. These concerns were alleviated, to some degree, by pretesting the questionnaire, comparing the results between the pretests and interviews, and by evaluating the internal reliability of the questionnaire results.

The results of this study can be said to represent farm operators in Alberta Agriculture's Northwest Region. As such, this study cannot be said to reflect the opinions, attitudes, and behaviors of all farm operators in Alberta. To be able to draw conclusions about all farm operators in Alberta, one would need to take a random sample of all farm operators so that every farm operator would have a known probability of being included in the sample. However, it is likely that similar results would be found, if a study of farm operators in all of Alberta were to be performed.

Outline of the Thesis

The research presented in the thesis is of the following format. Chapter 2 contains a review of the relevant literature. The discussion of theoretical and applied research will suggest the techniques that were used in the field study. Chapter 3 presents a discussion of the methodology employed in the study. Chapters 4 and 5 present and discuss the empirical results of the study. A descriptive analysis of the data collected from the field study is presented in Chapter 4 and an inferential analysis is presented in Chapter 5. Chapter 6 will draw conclusions from the results and discuss the implications of the study. Included in the Appendices are the self-administered questionnaire, the covering letter, and the first and second reminder letters.

Endnotes

1. William L. Flinn, and Donald E. Johnson, "Agrarianism Among Wisconsin Farmers," *Rural Sociology* 39 (1974).

2. Alberta Agriculture, *Information Needs of Alberta Farmers and Farm Families: Marketing Strategy* (Edmonton: Alberta Agriculture, 1983).

3. Ibid.

4. G.C. Van Kooten, R.A. Schoney, and K.A. Hayward, "An Alternative Approach to the Evaluation of Goal Hierarchies among Farmers," *Western Journal of Agricultural Economics* 11 (1986), p. 40.

5. J.B. Hardaker, and J.R. Anderson, "Why Farm Recording Systems Are Doomed to Failure," *Review of Marketing and Agricultural Economics*, 49 (1981).

2: THEORETICAL FRAMEWORK

Decision theory as used in the academic fields of psychology, economics, sociology and statistics "...refers to a way of analyzing the determinants for individual choices - the descriptive or normative rules pertaining to people making up their minds about what is true or what they should do."[1] The observance of decision-making behavior provides an understanding of how people act when faced with a problem situation. If this information, gathered from observation, is to be of any value, there must be additional understanding of why people act in the manner in which they do. The study of farm operator decision-making behavior requires a theoretical comprehension of the basis of human action and motivation. Similarly, insight into goals and values of farm operators cannot be attained without a prior understanding of basic human values. Once the theoretical basis of knowledge about human action and values has been established, their relation to the decision-making process, and more specifically the farm management decision-making process, can be determined.

Human Action

Decision-making has foundations in action and motivation theories. Action occurs upon completion of the decision-making process. An early publication by Parsons and Shils provided considerable insight into action theory.[2] The theory of action is based on the study of the structure of an individual's orientation to a given situation. According to Parsons and Shils, there are two dimensions to an individual's orientation to a situation: motivational orientation and value orientation.[3]

The theory assumes that all behavior "...is directed by plans, that those plans are hierarchically arranged, and that the feedback from the environment articulates with plans in the guidance of action."[4] In decision-making theory, these plans are referred to as goals. Kluckhohn identified four essential elements of action theory:

1) Behavior is oriented to the attainment of ends or goals or other anticipated states of affairs.
2) It takes place in situations.
3) It is normatively regulated.
4) It involves expenditure of energy or effort or 'motivation'.[5]

Motivation theory, as developed by Maslow, is based on a hierarchy of needs which motivate all human behavior.[6] As the level of satisfaction of basic human needs increases, the individual moves up the hierarchy. The needs higher up in the hierarchy do not emerge as strong motivators until the lower needs are reasonably satisfied.

Values

The concept of value is part of the theoretical foundation of a number of academic disciplines such as mathematics, economics, sociology, psychology and political science. The definition of value adopted in any given situation depends entirely upon the context in which it is being used. Rokeach defines a value as "...an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence."[7] To Kluckhohn, "A value is a conception, explicit or implicit, distinctive of an individual or characteristic of a group, of the desirable which influences the selection from available modes, means and ends of action."[8] A definition from an undergraduate sociology textbook is that "Values are the standards used to judge behavior and to choose among various possible goals."[9] Within the Social Sciences there are a number of common ideas in many of the definitions of value. Words and phrases such as "preference", "ubiquitous", "criteria for selection", "conception of the desirable", "enduring belief", "standards used to judge", "determination of goals", "selection of means" all contribute to the understanding of concept of value.[10,11,12]

In his influential discourse on values, Williams states:

> "...that all values contain some cognitive elements, that they have a selective or directional quality, and that they involve some affective component. Values serve as criteria for selection in action. When most explicit and fully conceptualized, values become criteria for judgement, preference, and choice. When implicit and unreflective, values nevertheless perform as if they constituted grounds for decisions in behavior."[13]

Values are not only held by the individual, but also by society. To a social researcher, societal values are easier to measure because they are embodied in the language, norms, laws and institutions of the society. Personal values are more difficult to identify as they are an integral part of the individual and, although they influence every action, are not necessarily conscious even to the individual. All human behavior is dictated by personal and societal values.

Goals

Goals are the more concrete end states of values. Goals are frequently equated with objectives and ends. Gasson differentiates goals from values in that values are more of a permanent characteristic of the individual.[14] Some goals can be viewed as ends in themselves, whereas other goals are means to further ends.[15,16] "Values give rise to the ranking of the importance of goals. They define the approved and disapproved means of attaining goals. Values are ideas, and can be inferred from the choices we make among alternative courses of action."[17]

Both goals and values are hierarchical in nature. Some goals and values are ends in themselves, while others are only means to achieve other higher order goals and values. "Through the hierarchical structure of ends, behavior attains integration and consistency, for each member of a set of behavior alternatives is then weighed in terms of a comprehensive scale of values -- the ultimate ends".[18]

Robin Williams identified the following list of 15 values which are felt to be reflective of North American value systems.

1. Personal Achievement and Success
2. Activity and Work
3. Moral Orientation with which to Judge Conduct
4. "Humanitarianism" Mores
5. Efficiency and Practicality
6. Belief in Progress
7. Material Comfort
8. Equality
9. Freedom
10. External Conformity
11. Science and Secular Rationality
12. Nationalism, Patriotism
13. Democracy
14. Individual Personality
15. A value orientation that runs counter to and conflicts with the individual personality linked values as listed above - namely, Racism and related group superiority themes.[19]

Value Orientations

Individual actors do not have just a single value which governs their behavior, rather they have many values which are part of an all encompassing value orientation. A "Value orientation may be defined as a generalized and organized conception, influencing behavior, of nature, of man's place in it, of man's relation to man and of the desirable and non desirable as they may relate to man-environment and inter-human relations."[20] A value orientation influences the manner in which the individual views the world.

Value orientations are likened to rank ordered principles which result from cognition, affection and "directive elements - which give order and direction to the ever-flowing stream of human acts and thoughts as these relate to the solution of "common human" problems.[21]

Parsons et al. observed that whenever an individual must make a decision, "...his value orientations may commit him to certain norms that will guide him in his choices."[22] All human behavior is governed by value orientations.

Decision-making Process

The purpose of every action is to achieve some goal. "Decisions to act are made by [people] on the basis of how they perceive their environment and themselves, including their goals and their possibilities to act."[1] Decision-making is a dynamic process that takes place in a cyclical fashion. The end of one cycle of the decision process is the achievement (or non achievement) of a goal. As shown in Figure 1, the cycle of the decision-making process begins at the point of recognition of a problem.

Problem Definition

The problem stage (Stage 1 of Figure 1) is initially recognized when there is a difference between the goals of the individual and the reality of the situation within which that individual exists. "[An] individual... undertakes to find a new goal or goals because of dissatisfaction with outcomes within an existing goal structure. The present payoff structure growing out of the present set of goals is... less than an individual's... level of aspiration".[2]

> A problem cannot exist without a goal also existing, since a problem is a block to a goal. Furthermore when a problem is encountered, the goal towards which the farm manager is moving becomes either subordinated to a more immediate goal (the removal of the problem) or, if the problem is ignored or its definition proceeds over a period of time, there is reduced goal attainment. This may or may not be a significant perceived loss to the farm manager.[3]

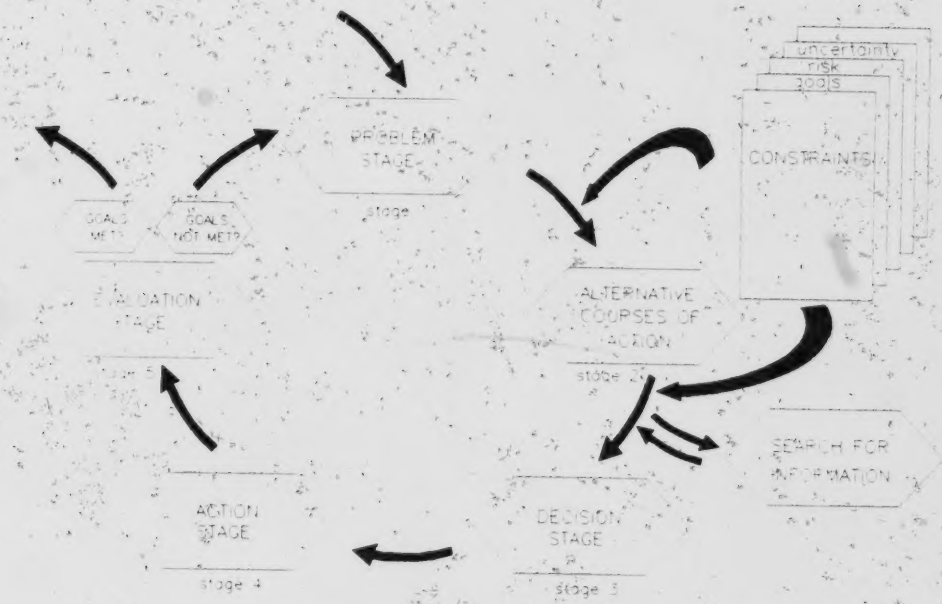
Analysis of Alternative Courses of Action

Upon recognition of a problem, the process of identification and analysis of alternative courses of action (Stage 2 of Figure 1) begins. When only one alternative or no alternatives, are available, the individual is forced into making a decision (Stage 3 of Figure 1). When there is a choice of more than one alternative, the decision maker must consider the relative worth of all the alternatives by gathering information.[4] The process of evaluating alternatives and their consequences is affected by various constraints. The decision maker's goals which are prevailing at the time of the decision will limit the number of alternative courses of action that will be considered. Other sources of constraint are the risk and uncertainty inherent in the environment of the decision maker. An additional constraint in the identification of alternatives is the "cognitive limitation" of the decision maker. Because of these constraints the decision maker will attempt to simplify the decision-making process.[5]

The first strategy for simplification of the decision-making process is to reduce the number of requirements to be met.[6] This strategy can be accomplished by reducing the number of goals that the decision maker expects to be met by the decision.

FIGURE 1

THE DECISION-MAKING PROCESS



Adapted from: L. Bauer, "Risk in Agriculture and its Management." Class notes for Agriculture Economics 400, University of Alberta, 1987, and J.H. Cleave, "Decision Making on the African Farm," in *Contributed Papers Read at the 16th International Conference of Agricultural Economists*, ed. by International Association of Agricultural Economists (Oxford: International Association of Agricultural Economists, 1977).

Another strategy for simplification of decision-making is to reduce the number of alternatives considered by ending the information search when the first satisfactory alternative is found. Simon refers to this strategy as a 'satisficing' approach as opposed to the optimizing approach of classical economics.[7] The decision maker "...behaves rationally with respect to [the simplified] model, and such behavior is not even approximately optimal with respect to the real world".[8]

Risk and Uncertainty

A situation of uncertainty occurs when the probability of a particular outcome occurring is unknown. If there is no uncertainty about the outcomes of the alternative courses of action, the rational decision maker will choose the course of action that will produce the outcome that best

satisfies his goals. If there is uncertainty about the consequences of an alternative, the decision maker will either attempt to reduce the uncertainty about an alternative or will simply choose an alternative and evaluate the consequences after the action has occurred.

Risk is defined as "...the decision-making situation where there is a chance of an unfavorable outcome for one or more of the alternative actions being considered".[9] In situations of *risk* there is a known probability of something happening that the decision maker would rather did not happen.[10]

An individual is said to be risk averse "...if, from a position of uncertainty, he is unwilling...to take a bet which is actuarially fair...".[11] One's attitude toward risk is a personal attitude which is tempered by the stage of the family life cycle, socioeconomic status, "...age, experience, education and, as well, the results of past decisions and activities."[12,13]

Tversky and Kahneman hypothesize that people evaluate uncertainty and judge the probability of an event occurring "...by the ease with which relevant instances come to mind".[14] The decision maker faced with uncertainty will, therefore, tend to underestimate the chance of an event that has not taken place in recent memory; and overestimate the chance of an event that has occurred recently. The probability so assigned to the situation is a subjective probability and in effect, turns an uncertain situation into a risky situation.

Information

The rational decision maker faced with uncertainty will search for information that will allow him/her to move toward a situation of certainty or risk with known probabilities.[15] The acquisition of information is a method of reducing the uncertainty and risk associated with making a choice. The more information an individual is able to acquire about an alternative and it's potential consequences, the less risk that individual has of choosing an alternative with unwanted consequences.

> Information...is a decision input that usually integrates data from different collection processes and subject matters with analytic interpretation... Information is data that is processed, organized, interpreted and communicated to provide utility in a specific decision or problem context.[16]

On a daily basis an individual is faced with an inundation of information through the mass media (newspapers, magazines, radio, and television). The individual is unable to absorb all of this information which leads him/her to prioritize the information. Priority is assigned based on the utility of the information to the individual. The quality of the consequences of a decision depends on the

amount and **quality** of the information gathered. Information of poor quality may create more uncertainty. "The value of information in a decision depends on the extent to which it is 'news' to the decision maker. The value of new information is the value of the decision made with that information minus the value of the decision without it and minus the cost of the new information".[17]

> The amount of information the decision maker actually acquires depends on some marginal (or satisficing) calculus, in which he compares information cost to the value of uncertainty reduction.[18]

Because of the expense of time and money, the search for new information does not take place every time a decision is required. Information can be stored in various forms of memory, which act as "...artificial associational and indexing devices" such as human memory, files, record books and computer programs. Subsequent decisions depend on memory to minimize the need for trial and error testing of alternatives, which is a time consuming process.[19]

Education provides a bank of memory from which information required for decisions is accessible. Huffman found in his study of allocative efficiency in corn production that "...decision makers with more education can more quickly grasp changes and adjust more quickly and accurately to them".[20]

Personal experience is a major source of information in the decision-making process. Values and value orientations "...emerge from the fundamental experiences of men, and are, therefore, subject to all the external conditions of that experience..."[21] The accumulation of life experiences provides the individual with an accessible memory-bank of information as to the efficacy of various actions and also the value orientation with which to consider actions and outcomes.

Habitual actions result from extensive experience with a particular problem. Decisions that occur frequently require little new information and tend to become habituated. "Habit performs an...important task in purposive behavior, for it permits similar stimuli or situations to be met with similar responses or reactions without the need for a conscious rethinking of the decision to bring about the proper action".[22]

Information serves to reduce uncertainty, however, it is important to recognize that information has a cost. The individual will seek information as long as the cost is justified.

> ...by a sufficient expenditure [the effect of ignorance] upon people can be kept within tolerable or even comfortable bounds, but it would be wholly uneconomic entirely to eliminate all its effects. And...our understanding of economic life will be incomplete if we do not systematically take account of...ignorance.[23]

Action

At some point the decision maker must choose and implement one of the alternatives that was considered (Stage 4). Even if the choice is to forego making a decision until some point of time in the future, the decision maker must make some choice. The decision cycle nears one revolution when the action has been taken. At this point the decision maker evaluates the outcome to determine whether the problem was solved.

Evaluation

Some evaluation of the decision takes place throughout the decision-making process. A more formal evaluation of the entire process occurs at Stage 5 in Figure 1. A rational evaluation of the results of the decision-making process is to compare the outcome of the process to the goals of the decision maker.[24] Rationality is described by Gasson as "goal-directed behavior".[25] If the decision maker is satisfied that his/her goals have been met by the outcome, the decision-making process continues in a shorter cycle of evaluation and reevaluation of the outcome.[26] If the decision maker is not satisfied with the outcome, this becomes a new problem and the decision cycle begins again.

The goals that affect an individual in any one decision may not be the ones that affect any other decisions that the individual makes. "The theory of aspiration indicates adaptive flexibility whereby goals may be raised, lowered, or changed in the light of experience".[27]

Decision Frame

The decision process, in its entirety, is bounded by the decision frame of the indivjdual decision maker. The decision frame is:

> ...the decision-maker's conception of the acts, outcomes, and contingencies associated with a particular choice. The frame that a decision-maker adopts is controlled partly by the formulation of the problem and partly by the norms, habits, and personal characteristics of the decision maker.[28]

Ilbery refers to the decision frame as the decision environment. "The decision environment...affects the degree of conscious decision-making [and] is affected by a farmer's perceptions and value system. It is the way in which a farmer perceives the world which is important, rather than what is actually there."[29]

It is important to consider that the outcomes of the decision process may be economic, political, social or psychological in nature. The values, habits and personal characteristics of the decision maker comprise a large part of the value orientation of the decision maker.

Concepts Relevant to Family Farm Management

Family Farming

The interaction between the farm family and the farm business makes the family farm unique from any other business. The interdependence of the two arises because they share a common stock of limited resources[52]:

> ...the allocation of which is the concern of economic decision- making, and the activities and decisions carried out by the household are both affected by and affect the scope for action by the firm. Thus, at the simplest, the household depends on the farm to provide subsistence and cash for its members, whilst the farm firm relies mainly upon the household for its labor needs and often also for purchased inputs.[53]

The combination of farm and family interests competing for scarce resources is complicated due to the presence of the family members. Every family member has an interest in decisions which affect both farm and family, and thus can be considered a decision maker. The allocation of resources, on the farm, is further complicated by the fact that each of the decision makers possesses their own set of goals and objectives which they want satisfied.[54] Because of the sharing of resources, there frequently arise situations in which the objectives of the farm, in terms of production or investment, conflict with the household, in terms of consumption.[55,56] As a result, compromises occasionally need to be made between farm investment and household consumption. Research by Harrison demonstrated that "...family needs are very often placed second to the firm's requirements...."[57]

The need to allocate resources between the farm family and the farm firm causes farm operators to seek additional sources of income. Many farm families periodically or regularly seek employment off the farm.

> ...As the terms of trade for agriculture have declined since the 1950's farm families who wished to continue farming either had to enlarge their operations or were required to supplement their farm income with work off the farm. Hence, off-farm work has become a means for the reproduction of the household and continues as value is placed upon farming as a way of life.[58]

Concern about the maintenance of the farm for future generations affects many farm management decisions. In a study of the effect of family interests on the management of the farm, Carlson and Dillman noted that "two generations farming together seem more likely to be sensitive to the importance of maintaining the productivity of the soil for future generations".[59] For example, farmers who are working to establish continuity of the family farm are more likely to consider soil conservation techniques than those who are not concerned at all with the long term future of the farm.

Family Life Cycle

"The interdependence of the farm business and farm household (including the preferences of families) creates a cycle where the quantity of capital employed parallels the cycle of the farm family".[60] Consequently, the financial behavior of the farming operation will also reflect the cycle of the farm family. Barlett identified a relationship between the choice of risky, labor intensive crops and the stage of the family life cycle. The data indicated profit consideration was not the sole factor influencing the decision-making process, but rather factors such as the degree of drudgery involved were important in the consideration of crop rotations. The stage of the family life cycle was a key determinant in evaluating the amount of heavy work that would be tolerated.[61]

Another example of the parallel nature of the family life cycle and financial behavior is the attitude towards risk. Younger farmers are more likely to feel comfortable with riskier investments than older farmers. In the case of the younger farmer, because the family is more likely at a younger stage of the family life cycle with higher household consumption needs, he/she is more likely in need of capital and will tend to accept more risk. Older farmers tend to be more concerned with maintaining a comfortable living for the rest of their lives and are less likely to feel comfortable risking their future because they have less time to rebuild if they lose out on an investment.[62]

Although values may stay relatively unchanged for the farm family throughout the family life cycle, the concrete goals and objectives may change to reflect the changing needs and interests of the farm family. A study by Harman et al. found that a goal of an increasing net worth increases with education, farm experience and farm size, but decreases with age.[63]

Off-farm employment can also be seen to reflect the family life cycle. Reddy and Findeis noted that people who work off of the farm tend to be younger and are less likely to have young children at home.[64] Younger farmers who are in more need of capital are more likely to work off the farm. Older farmers are more likely to want to reduce the amount of time worked and, consequently are less likely to work off the farm.

Farm Goals and Values

As discussed earlier, personal values and goals provide the impetus for all human behavior. Values are ideas of *the desirable* held by individuals, groups, and society.[65] Values are organized into a system of value orientations which determines goals. Much of the research in the area of individual

values has inferred value orientation from measurement of goals. This is done because values are so central to an individuals' makeup that they are more difficult to quantify or measure. Goals, being the more concrete end states of behavior that are desired, are easier to observe.

Values that have traditionally been attributed to rural North Americans are related to quality of life factors such as a good environment in which to raise children, clean water and air, little crime and friendly nature of community life.[66] From his research on rural Americans, Larson noted that although there are observable differences in values between rural and urban people, these differences are not as great as many have hypothesized. In addition, Larson notes that "no unanimity, no solid front pro or con, exists among rural people on any statement from which values may be inferred or on any value related belief or behavior."[67] This indicates that although rural values may be different in certain ways from urban values, there is not a single overwhelmingly rural value.

Research by Salamon identified the existence of communities which demonstrate unique agricultural structures, 'entrepreneurial' and 'yeoman' types, based on ethnic characteristics. These communities demonstrate different goals, strategies, farming organizations, family characteristics and community structures because of their differing value systems. The 'yeoman' farmers are descendents of German Catholic immigrants, and they place emphasis on farming as not only a way of life, but also as an identity.[68] A more concrete goal of the 'yeoman' farmer is to "reproduce a viable farm and at least one farmer in each generation."[69]

In Contrast to the 'yeoman' farmer is the 'entrepreneurial' farm operator to whom farming is a business. To the 'entrepreneurial' farmers, descendents of old American, or 'Yankee', settlers, a concrete goal of farming is "to manage a well-run business that optimizes short-run financial returns."[70]

Gasson identified the central values in farming as being ***instrumental***, influenced by the desire for financial gain; ***social***, related to family or community recognition; ***expressive***, achieving a sense of personal growth and achievement; and ***intrinsic***, desiring independence and enjoyment of occupation. Gasson's distribution of the ranking scores assigned to attributes of the occupation of farming, which are thought to represent value orientations, is presented in Table 1. The most commonly cited value of farm managers was related to intrinsic qualities, such as feelings of independence and personal satisfaction. Instrumental qualities, including financial desires, were reported as important values, less frequently.[71]

TABLE 1.

IMPORTANCE OF FARMING ATTRIBUTES TO CAMBRIDGESHIRE FARMERS

Attributes of the Occupation of Farming	Score

Table 1. entitled, "Importance of Farming Attributes to Cambridgeshire Farmers", has been removed from this thesis as copyright permission was unavailable. This table contained the results of research by R. Gasson in which 16 attributes of the occupation of farming were presented with the corresponding rank scores assigned by respondents.

SOURCE: Ruth Gasson, "Goals and Values of Farmers," Journal of Agricultural Economics 24 (1973) p. 529.

Kerridge replicated Gasson's study and found that farmers on larger farms tended to express instrumental values and those on smaller farms expressed intrinsic values.[72] Similar results were found in a Canadian Study in 1979 which showed that farmers with a 'business' orientation (instrumental values) tend to have higher levels of income than those operators with non 'business' or social orientation.[73]

The existence of multiple goals that compete, complement, or act independently between the family farm household and the farm business, between individuals, and even within the individual must be recognized.[74] "Since farmers must maximize many goals simultaneously, any attempt to force the complexity of their decisions into a profit orientation will necessarily leave out some considerations."[75]

Risk and Uncertainty in Farming

The uncertainty inherent in farming arises because of a number of variables which are beyond the control of the individual farm operator. Hirshleifer and Riley identify two sources of uncertainty with which the decision maker is faced.[76] Market uncertainty arises when the decision maker is unsure

about the market behavior of other economic agents. Olsson argues that farmers are continually faced with an increasing amount of uncertainty largely as a result of "...the increasing integration of the agricultural economy into the economy of the whole society and the world economy."[77] International political forces, which represent a form of market uncertainty for the individual producers, can influence the demand for agricultural products in a manner that does not always reflect the actual world demand for food.[78]

Event uncertainty occurs when the decision maker is uncertain about events that may occur outside of the market. Examples of event uncertainty in agriculture are changeable weather patterns, the finite nature of resource availability, and changes in public policy that may affect taxes.[79]

Attitudes towards risk are influenced by a number of personal, including personality, characteristics. For example, an older farmer is less likely to assume risk because:

> ...he recognizes income uncertainty and the uncertainty of life itself. With a limited span of life before him, the older operator is reluctant to make investments involving large risks even though they may appear more profitable. An unsuccessful investment adventure lessens the opportunity for recovery in the case of the older operator...[80]

Rogers and Shoemaker found that early adopters of innovations tend to have a "...more favorable attitude toward risk".[81] These are the farm operators who are more willing to try the new innovation because of it's apparent benefits. Recent research by Hazell indicates that most farmers tend to behave in ways so as to avoid risk.[82]

Sources of Information

In order to be able to adopt new technological improvements, the farmer must be aware of the innovation and familiar with its usefulness. This information is needed to be able to weigh the advantages of the innovation against the disadvantages, and in this way to minimize risk.[83] To become an informed user of the technology, the farmer must have access to relevant information.

There have been a number of studies identifying important sources of information for farm operators. In an early study of the role that agents of communication have in effecting technological change, Wilkening identified four categories of information sources: mass media, other farmers, agricultural agencies and commercial information sources. The mass media, which includes print, radio and television, was most effective as an early source of information on new technologies. The importance of mass media to farm operators has been identified in numerous other research studies.[84,85,86] The second category of information sources, other farmers, was the most effective

agent in the actual decision-making process to adopt or not adopt new technologies. The other communication agents: agricultural agencies, and commercial information sources were the most effective in providing instruction on how to initiate the changes dictated by the new technology.[87]

The data reported for the northwest region of Alberta Agriculture, from the 1984 report, Information Needs Study of Alberta Farmers and Farm Families, evaluated the importance of various types of information sources. The six most important sources of information were: Alberta Agriculture, district agriculturalists, elevator agents, farm magazines and newspapers, neighbors and friends, and radio programs. The next most important sources were suppliers and veterinarians. Of lesser importance as sources of information were bankers (or other credit agencies), Agriculture Canada, Television, and County fieldmen. Universities and colleges were rated last in order of importance as sources of information.[88]

Schomaker and Thorpe found that as the level of education of farm operators increased, so did the amount of consultation of outside sources of information, with both other people and mass media, increase.[89]

> Personal communication may...be a particularly important source of information because there is a tendency to implicitly trust the judgement of a friend or colleague. After discussing a new product with someone who has adopted it one is likely to feel that this person has carefully evaluated the information on which to base a decision. By making such an assumption which may not necessarily be correct, an individual considering the purchase of a new product can justify not having to collect detailed information.[90]

Farm organizations provide a central location for the communication of ideas. Research on involvement in farm organizations has shown that social participation in organizations is associated with early adoption of innovations (Rogers & Shoemaker, 1971, Mokhtar & Hoiberg, 1981). Rogers and Shoemaker found that early adopters of innovations tend to have more social participation, have greater exposure to mass media, more change agent contact, and seek more information about innovations than do later adopters.[91]

The majority of farm operators do not belong to any farm organizations. Jacobsen reported that those who do join farm organizations tend to be younger, have larger farms, higher than average gross farm incomes, more formal education, and less off-farm employment.[92] Blackburn et al. also reported that farmers with higher gross sales tended to have more involvement in social organizations.[93]

Contrary to the above findings, an analysis by Poole, in 1981, of dairy farms found that with increases in each of farm size, the degree of mechanization of the farm operation, and income level, the amount of participation in community organizations decreases. This decrease in organizational involvement occurs because as the farm becomes more mechanized, the complexity of farming increases and people find that they have less time available for social activities.[94]

Record Keeping As A Source of Information

An additional dimension of sources of farm management information is that which is found in farmers' record books. The farm accounting system, which is a record of the financial status of the farm operation, is a means of storing relevant farm management information in memory. These records overcome the limitations imposed by human memory and, as such, the farm accounting system is an important source of information for decision-making.

Castle, Becker and Nelson identify three purposes of farm accounting. The first purpose of farm accounting is for assistance in the preparation of financial reports which would be required for income tax purposes, loans or farm program applications. The second purpose of accounting is the diagnoses of deviations from the expected level of performance. This will identify strengths or weaknesses of the farming operation which may require attention. The third purpose of farm accounts is their assistance in the planning of future endeavors for the farm operation.[95]

Carlson found that although farmers realize that record keeping is an important function, they tend not "...to give this important aspect of the farm operation the priority necessary to provide an adequate basis for making the important farm decisions".[96] This lack of appreciation for the utility of accurate record keeping is noted throughout the literature. A 1984 study of Alberta Farmers found that the majority of respondents to a random sample used only a single entry record keeping system for their farm records, and only one percent used a microcomputer.[97]

Managerial Ability

Dillon refers to farm management as the "...process by which resources and situations are manipulated by the farm manager in trying, with less than full information, to achieve his goals".[98] 'Managerial ability' refers to the psychological ability of the farm operator to perform the act of managing the farm operation.[99] A central component of management is the making of decisions. The operator(s) of the family farm are faced with a wide range of management decisions in the areas of production, marketing, finance, personnel, household and family matters.

> Agricultural enterprises are not isolated, self-contained operations, but nodes in a complex web of intersecting institutions and communications. The enterprise manager is a receiver of signals from various subsystems: family members, the community, the economic market, the agricultural extension services, the private machinery and feed companies, and government bureaus. These influences also function as resources, constraints, demands, and incentives as well as information. These communications have multiple functions and multiple meanings, and the basic task of management, from the behavioral point of view, is to ascertain their many functions and meanings and make use of the results in operating an enterprise and raising a family.[100]

Previous research in the area of farm management and farm decisions has used many different factors in the measurement of managerial ability. The measure of management ability used by Blackburn, Brinkman, Driver and Wilson was based on responses to questions about education, fertilization practices, herbicide and insecticide use, livestock selection practices and the use of financial and production records. Lower income farmers tended to score lower on the scale of managerial ability than the larger, commercial farmers.[101]

Brien, Wrigley and Jardine operationalized managerial orientation as being the average of "conceptual skill" and "exposure to the Department of Agriculture."[102] Exposure to the Department of Agriculture was seen to be a sign that the farm operator actively sought technical advice. In their study, the significance of managerial orientation was "...that it is a characteristic which facilitates adaption by the farmer to changing conditions or to the advent of new techniques."[103]

Frequently, managerial ability has been measured by the financial success of the farm operation.[104] Because of the influence of neoclassical economics, many studies have considered farm management decisions to be guided by fundamental economic principles. The quest for profit has been recognized as the most important goal of farm operators, and as a consequence, much of the research has evaluated farm managers on the basis of their achievement of the goal of profit maximization.

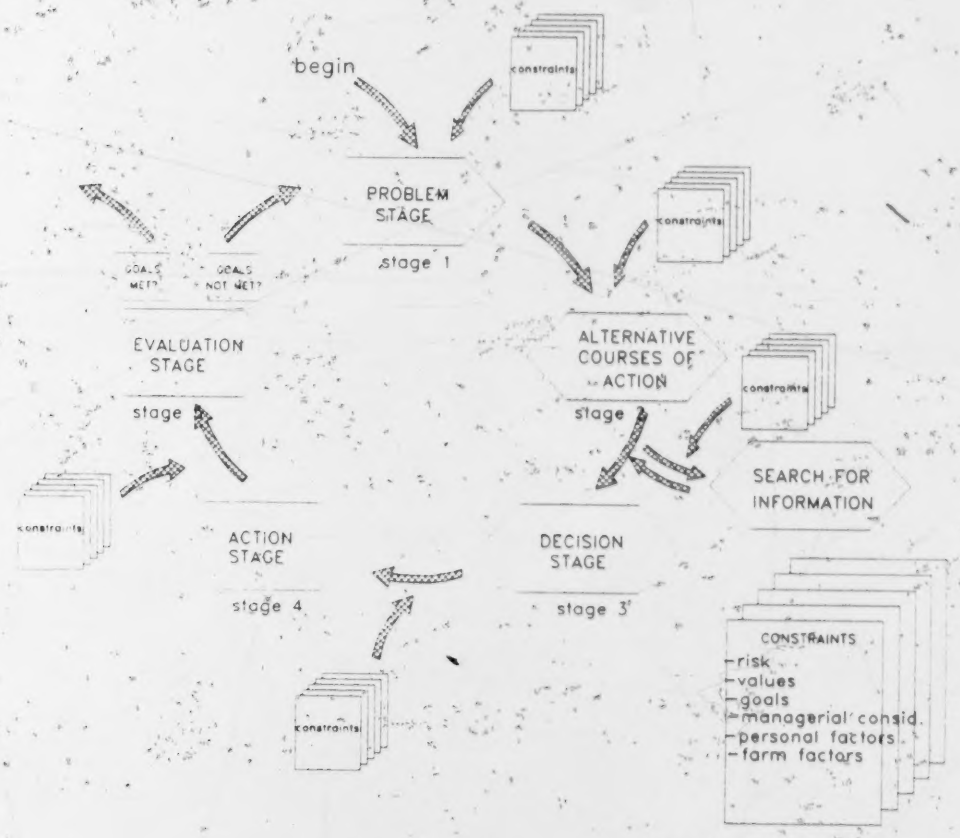
The Family Farm Management Decision Process: A Framework

The theoretical basis for the literature review is presented in Figure 2. The actual decision cycle remains the same as was presented in Figure 1, but other important factors which influence the decision-making process have been included. The decision-making process of the farm operator is influenced by constraints in the form of personal characteristics of the farm operator and farm firm, risk preference, personal orientation, as derived from goals and values, external constraints, and managerial ability.

All farmers are faced with similar problems but actual decisions vary because farmers have different goals, different levels of knowledge and vary in their aversion to risk and uncertainty.[105]

FIGURE 2

THE REVISED FRAMEWORK OF THE FARM DECISION-MAKING PROCESS



It is important to note that the constraints influence the decision-making process at every stage. The constraints affect the number and types of alternatives that are considered, the information search, whether a decision will even take place, how the action will be implemented, and the continual evaluation that takes place.

> ...if we want to know how or why a farmer acts in a certain way or how to induce him to act in a certain way, we have to inquire why men act, and especially why men act as they do when they live in the sort of social environment and general circumstances in which farmers live.[106]

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3. DESIGN AND METHODS OF RESEARCH

The Setting of the Study

The study was conducted in an area situated in Central Alberta that includes County 7 (Thorhild), County 11 (Barrhead), County 12 (Athabasca), County 20 (Strathcona), County 25 (Leduc), County 28 (Lac Ste. Anne), County 31 (Parkland), Improvement District 14, Improvement District 15, Municipal District 90 (Sturgeon), Municipal District 92 (Westlock), and Edmonton. These areas encompass Census Divisions 13, 14 and part of 11. Alberta Agriculture refers to this region as the Northwest Region or Region 5. A map, highlighting the area of study, is presented in Figure 3.

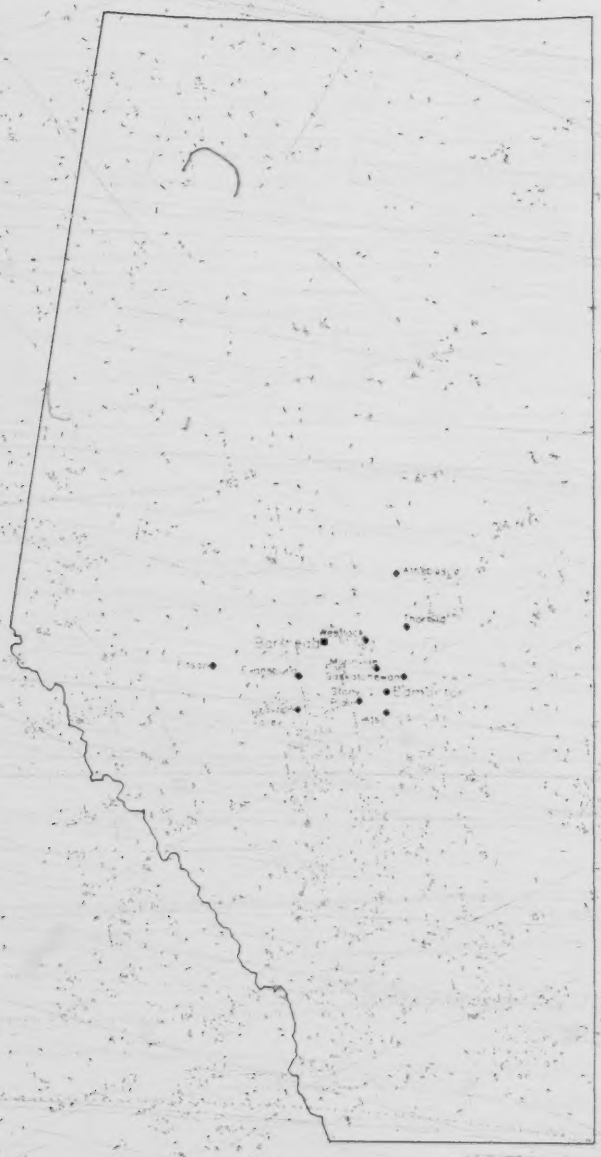
The land base in the Northwest region consists of an area encompassing 6.05 million hectares. A significant portion of this land is public land, classified as a Green Area, and is largely unsettled and heavily forested, which makes it unsuitable for most agricultural purposes except grazing. The 11,875 farm operations in the region occupy 2,275,736 hectares of land, 1,582,471 hectares of which is improved land and 693,257 is unimproved.

There is considerable variation in geographic characteristics of the region. This can have a significant impact on how decisions are made by limiting the alternatives that are available to the decision maker. The following geographic factors limit choice in farm decision-making in various areas of the region: existing soil types (the soil types that occur include grey wooded, black, peat, sandy, solonetzic and organic soils), excess acidity of the soil, excess precipitation, damaging frosts, short growing season, and topographical features which are not conducive to farming.[1]

Because of the variation in geographical factors, there is considerable variation in farming operations from all types of crops to many livestock operations. Cow/calf operations tend to predominate in the western region of the study area because of conditions that exist in the area that are not conducive to growing crops, such as poor soil types and a short growing season. The majority of hog operations in the study area are found in the area surrounding Barrhead. The majority of dairy operations are found in an area southeast of Leduc. Crops tend to be dispersed throughout the region, with specific varieties occurring in pockets of similar geographic conditions.

FIGURE 3.

MAP OF THE STUDY AREA



According to the 1986 Census, the area has a population of 865,747, with an urban population of 665,317 and an rural population of 200,430.[a] The urban population centers in the area are:[b]

1. Edmonton	573,982
2. St. Albert	36,710
3. Leduc	13,126
4. Spruce Grove	11,918
5. Hinton	8,629
6. Edson	7,323
7. Whitecourt	5,737
8. Stony Plain	5,802
9. Morinville	5,364
10. Drayton Valley	5,290
11. Westlock	4,532
12. Barrhead	3,991
13. Beaumont	3,944
14. Devon	3,691
15. Mayerthorpe	1,414
16. Bon Accord	1,355

There are many opportunities for farm operators in the region to supplement their income with off-farm employment. The presence of the large urban population centers provides many employment opportunities. In addition the forestry and oil/gas industries, which are dispersed throughout the region, offer lucrative job opportunities. The existence of the opportunity for off-farm employment will impact the manner in which some farm decisions are made, by providing alternative choices for sources of income. Farm operators and their spouses in this region report a significant amount of off-farm work. According to the 1986 Census of Agriculture, the areas within the region that report the highest number of days of off-farm employment, in order of number of days, are:

1. Edmonton
2. County of Strathcona, Number 20
3. Municipal District of Sturgeon, Number 90
4. County of Parkland, Number 31

Research Objectives and Questions

To facilitate a thorough analysis of the research problem, a formal development of the research objectives was deemed to be a necessity. The research objectives should naturally suggest the questions

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a) The definition of an urban population that was used in this study is as defined by Statistics Canada in the 1986 Census Reference Dictionary. An urban area "... refers to persons living in a continuously built-in area having a population concentration of 1000 or more and a population density of 400 or more per square kilometer, based on the previous census".

b) Fort Saskatchewan, with a population of 11,983, is excluded from this list because it is not considered to be an urban area since the population is less than 400 people per square kilometer.

needed to study the problem. As stated in Chapter 1, the objectives of this study are to analyze the relationship between personal/farm firm characteristics and the personal orientation of farm operators and to analyze the relationship between the personal orientation of farm operators and the amount of managerial consideration that is exhibited in their decision-making processes.

The research questions that evolve out of the initial objectives are: (1) What is the nature of the relationship between a farm operators' personal and farm firm characteristics and their personal orientation, as derived from their goals and values? and (2) What is the nature of the relationship between the personal orientation of farm operators and the amount of managerial consideration employed in their decision-making process?

Nature of Data Required

To answer the above research questions, the following data are required:

Social/Personal Characteristics:

a. Age of farm operator
b. Age of spouse
c. Educational background of farm operator
d. Educational background of spouse
e. Stage of family life cycle
f. Sex of farm operator
g. Length of time of farm in family
h. Risk Preference
i. Organizational involvement score

Farm Firm Characteristics

a. Farm type
b. Farm size
c. Number of livestock
d. Gross Sales

Personal Orientation

a. Measure of goal orientation.

Score Of Managerial Consideration In The Decision-making Process

a. Information seeking behavior

b. Use of records

c. Knowledge of economic principles

Formulation and Management of the Study

The initial impetus for the study came from field staff from the Northwest Region of Alberta Agriculture. These staff members were wondering what was causing the poor attendance by farm operators at farm management and decision-making extension seminars offered by Alberta Agriculture. Drawing from their own practical experience, and that of their families, they wondered if, perhaps, farm decisions were being made based on 'non-economic' factors that were not discussed at extension seminars. Contact was made with researchers, in the field of Rural Sociology, at the University of Alberta, to discuss both the problem and the potential for a research project to study the problem.

When the plan for the research project was formulated, it was decided that an advisory committee involving the field staff from the Northwest Region of Alberta Agriculture, who had initially identified the problem, would be established. The purpose of the advisory committee was to provide input on the scope and understanding of the interests of the field staff who regularly work with farm operators. This advisory committee grew in scope to include researchers from the University of Alberta, and from Alberta Agriculture.

The information for the study was collected in four stages. The first stage of the research process involved consultation with staff from Alberta Agriculture. Meetings and consultations with the advisory committee, consisting of Alberta Agriculture employees and researchers from the University of Alberta, benefited the design and scope of the study.

The second stage involved an in-depth qualitative analysis of the relevant literature. The purpose of the literature review was to provide a theoretical basis which assisted in the design of the interview and questionnaire. The literature review examines the topics of decision-making theory, farm management, family concepts, and the social, psychological and economic factors which influence the decision-making of farm operators.

In the third stage of the study, in-depth interviews with nine selected farm operators in the Northwest Region of Alberta Agriculture were conducted to provide qualitative background data for the project, and to test various question formats for potential inclusion in the questionnaire design. This data aided in providing insight into the decision-making process and it assisted in the development

of a valid questionnaire. The fourth stage of the project was the field study which required data collection, through a mailed questionnaire, and analysis of quantitative data to test the hypothesized relationships.

The Universe and Unit of Analysis

The universe for this project was the 11,875 farm operations, as per the 1986 Census, in Alberta Agriculture's Northwest Region. The Northwest Region was chosen because of the interest demonstrated by Alberta Agriculture field staff from within the Region.

The interconnected nature of the farm business and the farm family means that farm management decisions cannot be made by an individual in isolation from the rest of the farm family.[2,3] It is important in performing a study of family farms that the decision-making body include representation of both farm and family interests. Therefore, it is essential to have, as the unit of analysis, all of the key decision makers in the family. The basic unit of analysis of the study is the body within each farm household that is responsible for farm management decision-making. This decision-making body is comprised of the farm operator(s) and their spouse, and are referred to as the farm management team. Consideration of the plural nature of the decision makers recognizes the benefits that occur when more than one individual actually makes decisions. It is also reflective of the ownership of resources. Turner states that involving family members in the decision-making process creates the potential for providing more alternatives for consideration than would be provided by an individual decision maker.[4]

The list that Statistics Canada used for mailing out the questionnaires consisted of the names and addresses of the people who are listed as the farm owner. The questionnaire recipients were asked, in the covering letter that accompanied each questionnaire, to complete the questionnaire with their spouses. In addition, to further capture the idea of cooperative management of the farm, the respondents were asked, in the questionnaire, to indicate who they considered to be the farm operator. The response categories provided were: "husband", "wife", and "both husband and wife".

Selection of Sample for In-depth Interviews

The sample of farm operators who participated in the in-depth interviews were selected and identified by Alberta agriculture field staff from the North West Region. As the purpose of the personal interviews was to provide qualitative data to aid in the design of a valid questionnaire, it was not necessary

that this sample be representative of the entire population. The field staff on the Advisory Committee were asked to identify ten farm operators, from the region, who they perceived would be interested and willing to participate in an interview as part of this project.

Interviews were conducted with nine of the farm operators who had been identified by the field staff. Due to scheduling difficulties, an interview with the tenth farm operator did not take place. The personal interviews were conducted by the author. Since the purpose of the interviews was to assist in the design of the questionnaire, the data for these interview are not included in the final analysis.

Selection of Sample for Questionnaire

To ensure that the data were representative of the entire population, a probability sample was selected on a systematic random basis from the 11,875 farms in the Northwest region. The sample size was dictated by the desire to achieve a 90 percent level of confidence with a five percent level of precision. Precision refers to the "...maximum amount allowable which the proportion disclosed by the sample can very from the actual proportion of the universe."[5] These parameters mean that the proportion derived from the study sample should be within 5 percent of the proportion that characterizes the entire universe 90 times out of 100. For the purposes of the calculation of sample size, the proportion of the population who exhibit non-economic goals was estimated to be 40 percent.[6] From *Tables for Determining Sample Size and Sample Error*, the sample size required to satisfy the above conditions was determined to be 253.[7] The actual sample size was increased to 600 to compensate for the low rate of response that is usually experienced by questionnaires administered to farm populations.

The sample selection was performed with the assistance of Statistics Canada. Because of their concern with confidentiality, Statistics Canada researchers in Ottawa performed the actual selection of the sample using the sample framework supplied to them by the project researchers.

Design of the In-depth Interview as a Learning Tool

The in-depth interviews were undertaken as a learning tool to assist the researcher in the construction of the questionnaire and to pre-test the questionnaire while it was in the developmental stage. The interviews were structured into written and a verbal components and consisted of exercises related to the identification of key goals of the farm operators, analysis of decision-making tools and discussion about a major decision that the respondents had made recently. A variety of methods were used to elicit responses to the questions. If a method did not prove effective in any one interview, it was evaluated and then revised or eliminated as was necessary.

Various methods for capturing the information about the respondent's goals for their farm operation were used. The first method is a format similar to that used by Casebow in his 1980 study of goals and values of farmers.[8] The farm operators were presented with a list of attributes of farming as an occupation (ie. independence, income, security, ability to be one's own boss, etc.) and were asked to rank them in order of importance. The respondents were asked to rank the eight goal statements, from 1 to 8, in order of their importance. This procedure achieved the intended results, but repeated prompting from the interviewer was required to complete the task.

Ranking a large number of ideas, such as the eight statements in the interview, requires considerable concentration. A task that requires such a large amount of concerted thought would not likely be completed in a self administered questionnaire. Consequently, it was decided that ranking of a fewer number, such as the three most important statements out of the eight, would be included in the questionnaire.

A second method referred to as 'Magnitude Estimation', similar to that used by Patrick, was performed with the respondents being presented with a list of eight goal statements, one of which had been assigned a base value of 100. The respondents were then asked to assign numerical values to the remaining seven goal statements based on their importance to the participant relative to the base goal.[9] For example, if the value of leisure was assigned a value of 100 and the respondent valued work twice as much as leisure, then work would receive a value of 200.

This exercise caused confusion among the respondents and they tended to assign identical values to the majority of the goal statements. As a consequence of the poor response to this method of eliciting goal statements, it was not selected for use in the questionnaire.

The third method, which was used to determine the relative importance of goal statements, is the Paired Comparison technique developed by Thurstone in 1927.[10] This technique involves presenting the participants with each of eight goals in turn paired with the seven remaining goals. This procedure, in its entirety, required the respondent to examine twenty-eight sets of statements and to identify the most important statement in each pair. This exercise was not performed well, as the respondents found the repetition of statements to be boring. Some respondents expressed suspicion that the repetition was performed to check the accuracy of their answers. Because of the problems with this exercise, it was excluded from subsequent drafts of the questionnaire.

The fourth method for eliciting goals was using the open-ended question of "What are the most important goals of your farming operation?". This question was placed at a later point in the interview to allow the respondents to identify any goals that were not discussed in the previous questions.

The analysis of farm management tools that are used by the operators in their decision-making process was performed in the interviews by presenting a list of various information sources that the respondents' consult in their process of making decisions. The information sources were discussed and the frequency with which they were consulted was recorded. In addition, there was a discussion about the farm records that are kept and used in the process of making decisions.

To evaluate the decision-making/farm management process of the farming operation a series of questions were asked. The majority of questions were of an open-ended format to allow for the identification of new variables which had not been discovered from the literature search. There were questions about who, within the farm operation participates in farm management and decision-making. Decisions of major importance relating to the operation of the farm, and smaller yet recurring decisions were discussed as respondents are able to recall the processes undertaken in contemplating both major and recurrent decisions.[11]

Design of Mailed Questionnaire

As a result of the methods tried and pretested in the in-depth interviews, the design of the mailed questionnaire, presented in Appendix A, was simplified. Upon completion of the in-depth interviews, the various methods of asking questions tried in the interviews were evaluated as to their value as potential components of the questionnaire. The methods described above were either revised or eliminated, as was necessary. The majority of the questions that were included in the questionnaire evolved from the earlier questions that comprised the interview schedule and were tested in the interviews. The interviews provided an effective medium in which to evaluate questions on the topics of decision-making processes, goal orientations, and personal/social characteristics.

The format of questions chosen for inclusion in the questionnaire were of the following types: close-ended questions with ordered answer choices; close-ended questions with unordered answer choices; partially close-ended questions, which provided the respondent the opportunity for adding categories of response that were not foreseen by the researcher; scales; and rank ordering of categories.

In keeping with the desire to achieve a high rate of return, substantial consideration was given to the physical design of the questionnaire. The questionnaire design followed many of the guidelines suggested by Dillman using his Total Design Method.[12] The questionnaire consisted of twenty questions and required approximately twenty-five minutes for completion by the respondent.

The questions were arranged so that the response spaces followed a vertical line on the page. Theoretically, use of this format reduces the omission of questions that can occur when the respondent has to follow questions that appear all over the page. The vertical flow of questions also makes the questionnaire appear uncluttered and completion of the questionnaire does not appear to be a difficult task.

The questions appeared in lower case type and the response categories appeared in upper case type. This is a subtle, yet effective, psychological guide that aids the respondent in distinguishing between questions and responses.[13]

The length of the questionnaire was kept short (twelve 6 1/2 by 8 1/2 inch pages) to avoid annoying the respondents, by asking for too much of their valuable time. The questions, themselves, were not identified solely by numbers. Questions that were logically sub-sections of previous questions were assigned sequential letters, starting with 'A'. This technique was used so that the respondent answered only twenty 'questions' rather than a much larger number (approximately two hundred and eighteen), as would have been the situation if each component question had been assigned a number.

Special Features of the Questionnaire

The front cover of the questionnaire consisted of four specific elements: (1) a descriptive title of the questionnaire which served to reinforce the purpose of the study; (2) the origin of the study as being the University of Alberta, Department of Rural Economy; (3) a statement which encouraged respondents to make additional comments in the margins of the questionnaire; and (4) a logo consisting of an outline of a map of Alberta, with a stylized diagram representing a farm in approximately the location of the Northwest Region.

The back page of the questionnaire was left uncluttered except for the request for any further comments that the respondent might wish to provide in relation to the study. A significant portion of the page was left blank for the respondents to record their comments. The intent of this component was to emphasize the fact, already introduced on the front cover of the questionnaire, that the

researchers behind this study were truly interested in learning something from the unique knowledge that each individual farm management team has. At the bottom of the back page, the return address was included, in case any respondent misplaced the return envelope that had been provided.

The questionnaire, designed following recommendations from Dillman, was a booklet form, stapled in the middle, of an atypical size, the dimensions being 6 1/2 inches by 8 1/2 inches. The purpose of the unusual size was to establish a difference between this particular questionnaire and other questionnaires which the respondent may regularly receive from various agencies. The intent of having a unique format was to arouse the curiosity and interest of respondents who normally might not respond to questionnaires.

Pretest

The pretesting of the questionnaire was conducted in two stages of the project. The initial draft of the questionnaire was prepared, for pretesting, prior to the interviews. This draft was presented to the interview participants as the interview schedule. Subsequent to the initial pretesting in the interview, research was undertaken and questions from the initial questionnaire were deleted, added, or modified.

The next pretest was performed on as many of the initial interview respondents as were available, additional farm operators, Alberta Agriculture field staff, and colleagues in the Department of Rural Economy. In all, ten completed questionnaires were evaluated as part of the second pretest. Analyses of this second set of pretested questionnaires yielded information as to the reliability and validity of the survey instrument. As a result of this pretest, further modifications of the instrument were undertaken.

Administration of the Mailed Questionnaire

Subsequent to the changes suggested by the results of the pretest, a sufficient number of questionnaires was printed. Covering letters, shown in Appendix B, explained the origin of the study, the purpose of the study, the importance of participation in the study, and the involvement of Statistics Canada and Alberta Agriculture. The covering letters were inserted inside the front cover of each questionnaire.

The covering letter also requested that the farm operator and spouse, or the farm operators, complete the questionnaire together. In the case of an unmarried respondent, the farm operator was asked to complete the questionnaire. To encourage compliance, the importance of having the key decision makers from the farm household complete the questionnaire was stressed.

Questionnaires and cover letters were forwarded to Statistics Canada in Ottawa. They then placed the packages into envelopes and included a postage paid, pre-addressed return envelope. Employees at Statistics Canada then affixed labels with the survey participants' address and numerical identification code, both on the envelope and questionnaire, for each of the 600 participants which they had randomly selected.

As the questionnaires were returned, the names on the mailing list that corresponded to the identification numbers on the questionnaires, were crossed off the list. To maintain confidentiality of the questionnaires, the names and addresses present on each questionnaire were effaced with black ink.

Addresses of the respondents who indicated that they would like to receive a copy of the results were recorded on a computer file. When the final copy of results is prepared, each of those who indicated interest will receive a copy.

One week after the questionnaires had been sent to Ottawa, 600 reminder postcards were forwarded to Statistics Canada who again affixed the address labels of the participants. The postcards, an example of which is shown in Appendix C, reminded the participants about the study, the origin of the study, the purpose of the study, and the importance of their participation.

Four weeks after the reminder postcards had been forwarded to Ottawa, a second set of reminder survey packages were sent. The package included 385 questionnaires and cover letters to be mailed out to the participants who had not yet responded. The cover letter, shown in Appendix D, again reminded the participant of the origin of the study, the purpose of the study, and the importance of their response to the success of the project.

A list of the numerical identification codes that had been recorded off each questionnaire that had been returned with the address label intact was forwarded at the same time as the questionnaire packages. Statistics Canada subtracted the received numerical codes from their list of the study participants, and affixed the 385 remaining address labels to the packages. Again, a pre-addressed, postage paid envelope was included with the packages.

Response Rates

After the first mailing of the questionnaires, the rate of response was high with 204 usable questionnaires returned. The response to the second mailing of the questionnaire was somewhat lower with another 67 usable questionnaires being returned. A total of 271 questionnaires were received.

Statistics Canada used mailing addresses as determined from the 1986 Census and, as a result of elapsed time between 1986 and 1989, a number of respondents could not be located. Out of the total 600 in the sample, 19 respondents had moved or their address, as recorded by Statistics Canada, did not exist and, as a consequence, their questionnaires were returned unopened by Canada Post. A further 19 respondents had moved, sold their farms, retired or deceased since 1986, and their questionnaires were returned incomplete. As a result, the revised sample size was taken to be 562 (600 - 38). The final response rate was 48.22 percent (271/562).

A factor, unanticipated by the researchers, and which may have reduced the rate of response, was the presence of an adhesive label bearing the respondent's name, address, and unique numerical code on each questionnaire. These labels were affixed by Statistics Canada in order for the numerical code to appear on each questionnaire. Surprisingly, only three respondents expressed concern with the appearance of their name and address on their questionnaire. However each of these three questionnaires were completed. One respondent commented: "I am not sure how you assure confidentiality when my name and address is typed on this form!"

There are two possible explanations for the poor response from the second reminder letter and questionnaire. The second mail out coincided with warm, dry weather in May, and many farmers may have been busy with spring seeding and consequently did not complete the questionnaire. A second possible reason for the low response is that a number of farmers in this region were also selected to participate in the testing of Statistics Canada's 1991 Census of Agriculture, which was mailed out on May 15. Two respondents returned their questionnaires incomplete, with an attached note indicating their displeasure at being asked to participate in two surveys at the same time.

Analysis and Interpretation of Data

As the completed questionnaires were received, the following information was recorded on the questionnaire: the date of receipt; a three digit record number, assigned according to the chronological order of arrival; a one digit code indicating whether the questionnaire was received after the first or second mailing; and a code indicating the geographical location of the mailing address.

As they arrived, the questionnaires were read and edited, looking for obvious errors. Thorough consideration was given to each problem and, if possible, errors were corrected. Most problems were left unchanged, because of the difficulty, and potential for error in 'second guessing' the respondents' intention by responding in that manner.

All written comments on the questionnaire were recorded, assigned a computer code, and kept on a computer file. The codes corresponding to the comments present were recorded on each questionnaire.

A codebook was developed to assist in the coding of the questionnaires. This book lists each question, each response category and the corresponding alphabetic or numerical code that was entered into the computer. Because the response categories of the questions on the questionnaire are alphabetical or numerical, and thus are precoded, the coding was relatively simple. The editing and coding of data was performed by the author.

After the initial editing and coding of data was performed, the information from each questionnaire was entered to the computer as a record. A Rural Economy staff member entered each record to the data file, and then verified the accuracy of the entries on the computer by re-entering the data.

The data from the questionnaire was subjected to analysis using SPSSX language on the University of Alberta MTS Computer System. Using the RECODE and COMPUTE commands, the scores for risk preference, organizational involvement, personal orientation and the score of managerial consideration were calculated.

Managerial consideration was calculated by summing the responses to the questions on information consultation, importance of market and agronomic conditions, fertilizer decisions, frequencies of soil tests and profit calculation, decision-making tools used in the acquisition of capital assets, maintenance and use of financial records and the use of microcomputers in record keeping.

After the scores were calculated using the RECODE and COMPUTE commands, the frequencies of response, means, modes, percentiles, percentages of the responses to the descriptive, nominal, and ordinal questions of the questionnaire were calculated and presented in frequency tables.

These data were then analyzed inferentially using cross tabulation, chi-square, t-tests, Pearson Rank-order correlation, and analysis of variance to determine the influence of all identified factors on decision-making. The analyses are presented in the chapters that follow.

Reliability and Validity of Empirical Data

Before mailing, the questionnaire was pretested for validity and reliability of responses. The pretesting was performed on farm operators (and spouses) from the Northwest Region of Alberta Agriculture in the context of the personal interviews and, later, the questionnaire pretest. Field staff from Alberta Agriculture and research colleagues from within the Department of Rural Economy also assisted in the pretesting of the questionnaire. A questionnaire was presented to this sample and the returned copies were analyzed for validity and reliability.

The concern with validity of the instrument is to determine whether it measures the variables that are required for the study. Validity is more difficult to assess than reliability. However, the factual questions are straightforward and there are direct links between the information required for the study and the questions themselves.

The component variables of the complex scores were analyzed by external validation. This analysis compares a respondent's responses to the component variables to ensure that if they responded in a specific manner to one variable, they responded in a similar manner to the other variables.

How the Study was Received

The questionnaire was generally very well received by the sample. Many respondents personally telephoned the Department of Rural Economy and the researcher to obtain clarification about their status in the study. Others asked for clarification on specific questions, thus showing their concern and support for the study.

Very few legitimate (this excludes those who had moved, sold the farm, retired or deceased) respondents returned their questionnaire incomplete. A total of four respondents returned their questionnaires incomplete; two of the respondents gave no indication of their reasons for not completing; one indicated that he had also received Statistics Canada's 1991 Census Test questionnaire, and felt annoyed at what he perceived to be harassment; and one respondent indicated that he would take time out of his schedule to participate only if "at least" twenty dollars were forwarded to him.

The final page of the questionnaire was left blank and respondents were asked to record any comments or questions about the study. The majority of respondents did not provide any comments in this section. However of those who did provide comments, the majority were supportive of the study

and they indicated their interest in assisting research in this area: "Hope I helped in some small way to keep the family farm a healthy and prosperous way to live." The negative comments indicated that some respondents did not see how the survey would assist farming in Alberta.

The majority of respondents who commented indicated a frustration with the economic conditions associated with farming. A thirty four year old respondent summed up his attitude with the comment: "I am fed up with farming!" Many of the respondents provided analysis of the problems with farming in Canada, and offered potential solutions. Most of these indicated negative attitudes towards government such as: "It is impossible to make any long range plans ... due to the negative attitude of the federal and provincial governments", "Hell will freeze over before we get fair treatment as farmers!", And "To be totally honest, I don't trust government services."

Older respondents, especially senior citizens tended to negate the importance of their views, stating that they felt the survey should have gone to younger farm operators. "We really don't know how this [questionnaire] is going to help ... as we are on the verge of quitting". One respondent stated: "When you are 71 years of age, you're too old to make decisions of any kind. This is my last year of farming."

It was of interest to note the different perceptions of the questionnaire by those who responded after the first mail out, and those who responded after the second mail out. In the first mail out, positive comments, on the back page, were noted much more frequently than negative comments. However, the questionnaires that were returned as a result of the second mail out, contained significantly more negative comments.

Suggested Procedural Alterations

The interviews proved to be very good sources of information, and were invaluable for initial testing of potential questionnaire questions. The participants were interested in the project, and were generally pleased to be of assistance. To make additional use of their valuable input, further study in this area should involve farm operators in an Advisory Committee capacity throughout the project, rather than solely at the interview stage.

To facilitate higher rates of response in future research, it would be advisable to omit respondent names and addresses from the questionnaire, itself. It is presumed that some potential respondents did not return their questionnaire as they were concerned with the confidentiality of their information. A

second mail out of questionnaires to those respondents who fail to respond can be conducted as long as a numerical code is recorded on each questionnaire, which corresponds to a name and address contained in a separate computer file.

Endnotes

1. Alberta Agriculture, unpublished community profile reports from Alberta Agriculture offices in the Northwest Region.

2. E.P. Heady, W.B. Back, and G.A. Peterson, *Interdependence Between the Farm Business and the Farm Household With Implications on Economic Efficiency*, Bulletin 398, Iowa State College, Agricultural Experiment Station, 1953.

3. Ruth Gasson, G. Crow, and A. Errington. "The Farm as a Family Business: A Review," *Journal of Agricultural Economics* 39 (1988).

4. R. Turner, *Family Interaction* (New York: Wiley, 1970).

5. R.H. Portman, R.A. Mouradian, and R.R. Bruno, *Tables For Determining Sample Size and Sample Error* (California: National Research Foundation Press, 1975) p. 7.

6. Carlisle A. Pemberton, and W.J. Craddock, "Goals and Aspirations: Effects on Income Levels of Farmers in the Carman Region of Manitoba," *Canadian Journal of Agricultural Economics* 27 (1979).

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8. A. Casebow, "Human Motives in Farming," *Agricultural Progress* 55 (1980).

9. George F. Patrick, "Goals and Objectives of Farmers: Theory, Measurement and Empirical Results," *Revista de Economia Rural* 21 (1983).

10. L.L. Thurstone, "A Law of Comparative Judgement. *Psychological Review* 34 (1927).

11. Naomi Quinn, "do Mfantse fish sellers estimate probabilities in their heads?" *American Ethnologist* 5 (1978).

12. Don A. Dillman, *Mail and Telephone Surveys: The Total Design Method* (New York: John Wiley & Sons, 1978).

13. Ibid.

4: THEORY AND RESULTS

The data collected from the questionnaire were entered to the computer and subjected to analysis using the program, Statistical Package for the Social Sciences (SPSSx) Version 3.0. The purpose of Chapter 4 was to provide a description of the sample using data collected from the survey instrument. The descriptive presentation of the data was considered to be important in order to provide an understanding of the composition of the survey sample, and of the variety of the data collected in the study. The inferential data analysis is presented in Chapter 5.

Personal Characteristics of the Respondents

Data collected about the personal characteristics of the respondents were used to assist in the testing of the hypotheses. Data were collected about age, marital status, education, number of children and the amount of off-farm employment of the respondents.

Age of Farm Operator and Spouse

Age is a critical factor in any analysis of human behavior. There is an accumulation of life experiences as an individual increases in age. Future actions of the individual are directly influenced by the memory of past events in his or her life. In the decision-making process, the recollection of past decisions and their consequences dictates how the individual will act in the current decision process. These experiences will also shape the value orientation of the operator. An older person will have more life experiences on which to evaluate decisions than a younger person will.

Because of the physical nature of the occupation of farm operator, age can have a limiting effect on farm management and, consequently, decision-making behavior. With advanced age the farm operator is likely to choose to avoid strenuous physical labor thus reducing the number of actions that will be considered as alternatives in the decision-making process. As discussed in Chapter 3, a number of older respondents to the questionnaire indicated that they felt their age was limiting their ability to farm.

There is general awareness of the gradual aging of the North American population. This trend toward an older population is especially apparent in the farm population. Data from Statistics Canada indicate that the majority of employed Canadians are in the age category of 25 to 44 years (Statistics

Canada, February, 1989). Comparison of the Statistics Canada data to the average age of both the farm operators and spouses as determined from the survey, suggests that the population of farm operators in this study is significantly older than the general population of employed Canadians.

The age of farm operators in the study ranged from 24 years to 80 years, with the mean age being 50.8 years. The modal age of farm operators was 52 years. According to the 1986 Census of Agriculture data for Alberta, the modal category for age of farm operators is in the range of 50 to 54 years. Thus, the sample data for age appears to be representative of the actual age as derived from census data.

The age of the spouses of farm operators tended to be lower than their partners. The range of ages was from 24 to 78 years, with the mean being 47.3 years.

Stage of the Family Life Cycle

The interaction between the farm family and the farm business makes the family farm unique from any other business. The consumption and production activities of the family take place in one location. Every family member has an interest in decisions which affect both farm and family, and thus can be considered to be a decision maker. The stage of the family life cycle will affect the decision-making process. For example, farmers at an earlier stage of the family life cycle are more likely to perform off-farm employment, because their financial requirements are higher due to the presence of a young family. A household at a more advanced stage of the family life cycle is less likely to perform off-farm employment because the family is more mature. There is less chance of the family having dependent children and not as much need for extra income.

The value orientation of the household changes to reflect the changes in the stages of the family life cycle. For example, families at an earlier stage of the family life cycle are more likely to have childhood concerns as part of their value orientation than those at a more advance stage.

The tolerance of the decision makers toward risk can also reflect the family life cycle. A family at an earlier stage of the life cycle is more likely to accept more risk, given the opportunity for higher financial rewards, because there is a greater need for money for consumption when the family is young. A family at a later stage of the family life cycle is less likely to need as much money and will not be willing to accept as much risk.

TABLE 2.
STAGE OF THE FAMILY LIFE CYCLE

Family Life Cycle Stage	Freq.	% of respondents
Young Operator, No Children or Children Under age 19	54	22.5
Young Operator, Children 19 or Older	26	10.8
Older Operator, Children Under age 19	63	26.2
Older Operator, Children 19 or Older	97	40.4
Total	240	100

The frequency distribution of the stage of the family life cycle, presented in Table 2., indicates that the stage most frequently reported, is that where the operator is over 45 years of age and any children present are over the age of 19. The presence of a high percentage of households in this category is partially explained by the fact that the average age of operators in the sample is high, at 50.8 years.

Marital Status

The interconnected nature of the farm business and the farm family necessitates both communication between the two entities, and active participation in the decision-making process. As a result, marital status of farm operators is a major factor in the decision-making process. An unmarried farm operator comprises the entire farm household. The majority of farm decisions made by the unmarried farm operator will impact only the farm operation and the farm operator, him or herself. When the farm operator is married, or is a single parent, the farm household is comprised of two or more people. As a result, farm decisions become more complex and require input from more decision makers. Social considerations take on more of an important role in a household comprised of two or more people.

Research has identified a positive correlation between marital status for male farm operators and farm success. Unmarried males earn significantly less than their married counterparts.[1] Additionally, research in Alberta in 1952 found that the volume of farm production was higher on

farms where the male farm operator was married, than on farms where no adult women were present.[2] This suggests that farm productivity is positively affected by women's participation in farm labor or off-farm employment.

Of the respondents who answered the question about marital status, 84.8 percent, or 212 out of the 250, reported that they were married. Although the data are not directly comparable, according to the 1986 Canadian Census, 27 percent of Albertans over the age of 15 were single and had never been married. Sixty-four percent were married and 9 percent were widowed or divorced (Statistics Canada, 1986). Because the majority of the census population lives in urban centers, the results are biased towards urban respondents. The high percentage of married respondents in the survey sample indicates that a higher percentage of the Alberta farm population is married than is the urban population.

Identification of Farm Operator

Many studies of farm families assume that there is one person in the family who is considered to be the farm operator. Since most decisions concerning the farm operation effect the entire family, the decision process will frequently involve more than one person. Active involvement in the decision-making process is one of the main functions of the farm operator. Within the family, who is considered to be the farm operator(s) will effect how decisions are made.

A question was included in the survey to determine who, in the family unit, is considered to be the farm operator. The answer choices provided were 'husband', 'wife', and 'both'. Only those respondents who reported that they were married were asked who was considered to be the farm operator. The results, displayed in Table 3, show that 55 percent of the respondents considered the husband to be the farm operator, while 44 percent considered both the husband and wife to be the farm operators.

Additional written comments such as: "We are partners" (Respondent 141), and "Due to Wife's health she cannot do much farm labor but she is in on ***all*** our planning" (Respondent 074) lend further support to the data which indicate a significant number of farm operations where the husband and wife were both considered to be the farm operators.

Considering the large number of respondents who indicated that both husband and wife were perceived to be the farm operators, it was foreseen that some respondents would have difficulty in answering the questions that required an answer from both an operator and a spouse (The questions

TABLE 3.
IDENTIFICATION OF FARM OPERATOR IN HOUSEHOLD

Farm Operator	Frequency	% of respondents
Husband	128	55.2
Wife	1	0.4
Both	103	44.4
Total	232	100

about education, off-farm employment and age are the only questions where information was solicited from the operator and spouse). There was very little non response to these questions. Only 2.2 percent of respondents did not respond to the question about education of operator. Non response to the question about the educational level of the spouse was 20.3 percent. However, since 14.0 percent of the sample reported that they were not married, non response to the spouse questions can be reduced by that amount. As a consequence, non response to the question about the educational level of the spouse is only 6.3 percent.

To the questions about age, 2.6 percent of operators did not respond while 8.2 percent of spouses did not respond. Fewer respondents recorded answers to the questions about the amount of off-farm work performed by the operator and spouse. There was 14 percent non response to the question directed to the operator, and 14.8 percent non response to the question directed to the spouse. Although there is no accurate method for determining why the respondents chose not to respond to specific questions, it is possible that the higher level of non response to the off-farm employment question may be attributed to the large number of respondents who do not perform off-farm work and chose not to respond to the question.

The validity of these questions was not compromised by the inconsistency in terminology. The respondents self selected the category, operator or spouse, in which to record their answers. Due to the discrepancy it is impossible to determine which response represents a husband or wife; however, since the respondents chose to respond in the operator and spouse categories provided, this does not effect the explanatory power of further analyses.

Educational Attainment of Farm Operator and Spouse

Historically, much of the education that a farm operator needed for a career in farming was obtained on an informal basis. The farm operator learned through the experience of growing up and working on the family farm. Parents and peers provided additional information when it was needed. Consequently, formal education was not always a priority for farm operators in the past.

In more recent years, farming has become much more of a complex occupation. The farm operator must be familiar with a multitude of factors such as the most recent advances in animal and plant science research, and the workings of the national and international markets for their produce. As a result, the number and variety of complicated factors that a farm operator must consider has also increased. With the complexities inherent in farming, a formal education is now viewed as requisite for a career in farming. Previous research has supported the presence of a relationship between level of education and willingness to consider the adoption of new technologies.[3,4] Education and value orientation are related in that those operators with more education are more likely to have been exposed to alternative ideas and values that can influence their own value orientation.

Respondents were asked to record the highest level of educational attainment of the farm operator and spouse. The modal category for the highest level of education achieved by farm operators was from grades 7 to 9. As shown in Table 4, another notable peak in the distribution of results was in the category of those who had completed university level education.

The data indicate that spouses have a higher level of educational attainment than do their partners. The mode of educational attainment for the spouses is the category of high school complete. As with the operators, there is also a small peak in the number of responses in the category of those who had completed university. This finding is supported by previous research which indicates that farm women are generally more educated that farm men.[5] Historically, it was common for men to leave high school before graduation to assist in the operation of the family farm. Since women's involvement in farm work was not valued as highly as men's, they were more likely to stay in school and complete their high school education.

These data indicate that farm operators tend to conclude their education before the completion of high school. Fifty-three percent of the operators in the sample did not complete high school. However, of those that do continue to receive education beyond high school, there is a significant number (10.6) who complete university.

TABLE 4.
EDUCATIONAL ATTAINMENT OF FARM OPERATOR AND SPOUSE
(percentage of respondents)

Highest Level of Education Achieved	Farm Operator (n=265)	Spouse (n=216)
No Formal Education	0.4	0
Grades One to Six	5.3	0.9
Grades Seven to Nine	25.7	15.3
Some High School	21.9	23.6
Completed High School	16.2	31.5
Some College	6.4	7.9
Completed College	9.4	7.9
Some University	4.2	3.2
Completed University	10.6	9.7

A similar trend exists in the data for educational attainment of the spouses. The majority of spouses (60.2 percent) completed high school, but few continued beyond high school. Similar to their spouses, however, those that did continue to receive education, a significant number (9.7 percent) completed university.

Number of Children

The number of children present in a farm household will have an impact on the decision-making process. Farm decisions affect both the farm business and the farm family. Decisions made in a farm household where children are present will, by necessity, consider more factors than decisions made by a childless farm family or an unmarried farm operator. Similarly, there is increased responsibility on the part of the decision makers, for they must consider the impact of the consequences of their decisions on the welfare of their children. The impact of children on the decision-making process will change as the age of the children changes. Adult children living at home, and working on the farm, will likely assume more of an active role in the decision process of the farm household, than will an infant child.

The presence of children in the family will automatically cause concerns related to children to be of great importance in value orientation. For example, a family with young children is more likely to place high value on educational activities than a family with adult children.

Respondents were asked to record the number of children that they have. The number of children in the farm households ranged from zero to eight children, as shown in Table 5., the mean number of children was 2.6. There were two major peaks in the data corresponding to proportionately large numbers of households reporting zero and two children.

The 1986 Canadian Census data indicates that Albertan families with children had an average of 1.3 children at home (Statistics Canada, 1986) which is much lower than the survey results. However, these two data are not comparable because the respondents to the survey were asked to identify the number of children that they had, while the Census specified the number of children living at home. The Census data is also heavily skewed towards urban values in having children, because of the relative over-representation of urban people in the Census.

TABLE 5.
NUMBER OF CHILDREN IN RESPONDENT HOUSEHOLDS

Number of Children	Frequency	% of respondents
0	41	15.1
1	20	7.4
2	74	27.3
3	60	22.1
4	38	14.0
5	22	8.1
6	10	3.7
7	5	1.8
8	1	0.4
Total	271	100

Off-Farm Employment

Farm family members seek employment off the farm for a variety of reasons. Factors such as income level, family size, employment opportunities and education influence the amount of off-farm employment. Participation in employment off the farm increases the exposure of the individual to people who may have interests and attitudes which are different from their own. This exposure will broaden the base of experience and knowledge of the farm operator and can, potentially, impact the value system of the individual.

Because of potentially different values and attitudes, the decision processes on a farm where the operator and spouse are employed off of the farm part time will be different from a farm where there is no off-farm employment. In addition, the very reasons that caused the farm operator(s) to seek employment off of the farm will differentiate their decisions from those who do not seek off-farm employment. "For instance, they may decide to disintensify their farm production and earn higher income off the farm while maintaining their rural living and lifestyle."[6]

The amount of off-farm work performed by farm operators and spouses is presented in Table 6. For both farm operators and their spouses, the majority in the sample performed less than one week of work in one year off the farm. Other peaks occur for both at the categories of between two and six months and all year. A slightly higher percentage of spouses performed more off-farm work than farm operators did.

TABLE 6.
OFF-FARM WORK PERFORMED BY FARM OPERATORS AND SPOUSES
(percentage of respondents)

Amount of Time of Off-Farm Work Performed in One Year	Farm Operator (n=233)	Spouse (n=193)
Low (Less than one week)	50.6	46.6
Medium (2 weeks to 6 months)	15.9	22.2
High (7 months to all year)	33.5	30.8

In addition, respondents were asked to record the actual percentage of their total income that was derived from off-farm work. The results ranged from zero to one hundred percent, with the mean being 31.1 percent of total income derived from off-farm work.

Farm Firm Characteristics

To assist in the testing of the hypotheses, information about the farm firm was collected. This information included the history of the farm, gross sales, and farm size and type.

Length of Time Farming

Similar to the age of a farm operator, the length of time working on a farm will influence the accumulation of experiences from which to draw from to assist in decision-making. For example, a person who has worked on the same farm for a long period of time will have more familiarity with the agronomic conditions, and will have a larger store of information about the farm on which to draw to assist in decisions relating to soil testing.

A potentially negative consequence of the increased length of time spent in farming is the reduced willingness to consider new technologies. The operator who has worked on the same farm for a long period of time may develop a traditional way of doing things. The operator may become rigid to new ideas and only use technologies that he/she has tried and been successful with before. This reluctance to try new things will limit the opportunities of adopting new innovations that may improve the efficiency of the operation.

The respondents were asked to identify the number of years that they had been working on their current farm. The range in the number of years was from 2 to 75 years. The mean number of years on the current farm was 24.7 years (n=268). There were major peaks in the data at ten, fifteen, twenty, twenty-five and forty years.[7]

Length of Time That Farm Has Been in Family

In addition to the length of time that the respondents have been operating on the current farm, the bank of experience from which to draw information will be influenced by the length of time that the farm has been operated by the current operator(s) and their predecessors. If a farm has belonged to the family of a farm operator for a long period of time, that operator has the benefit of not only his/her own personal experience with the farm, but also the positive and negative experiences of his/her predecessors. This experience will clearly influence decisions.

The establishment of tradition on the farm is related to the number of years that the farm has been in the family. The accumulation of experience and traditions which correspond to an increased

length of time that the farm has been in the family can limit the behavior and attitudes of the farm operator. The farm operator may not even consider new innovations because of firmly entrenched, or traditional, responses to situations.

In addition, a farm that has been in the family for a long period of time is less likely to suffer from the debt load and financial stress that a newly established farm might incur. The reduced financial pressure will affect decision-making by providing more alternative courses of action available to the decision maker.

The range in the number of years that the farm had been owned by the current farm operators and/or their predecessors was from three years to 108 years. The mean number of years that the farm had been in the family was 39.1 years (n=257). There were four major peaks in the distribution at ten, fifteen, twenty-five and sixty years which indicates a tendency for the respondents to round off their responses.

Number of Generations on the Farm

The number of generations of a family that are currently living and working together impacts decision-making in a similar manner to the length of time that a farm has been in a family. Because of farm decisions affect the entire household, the decision process will be influenced by the differing levels of experience of each of the generations involved.

Respondents were asked to specify how many generations of their family were currently living and working on the farm. The majority of respondents reported that only one generation was currently on the farm. The frequency of responses is shown in Table 7.

TABLE 7.
NUMBER OF GENERATIONS ON THIS FARM

Number of Generations	Frequency	% of respondents
One Generation	133	54.3
Two Generations	93	38.0
Three Generations	19	7.8
Total	245	100

Gross Sales

An understanding of economic well being is essential to analyzing the process of making decisions. It provides a basis for comparison of farm households. In socio-economic studies, income level is frequently cited as a measure of economic well being. In studies of farm populations, however, income level is not so easily ascertained. Since most farm operators do not receive a salary from their farming operation, income level is derived by deducting expenses from receipts. This procedure is complicated by the fact that many farm operators may interpret and calculate income using differing criteria. In addition, expenses and receipts can accrue on a continual basis, so income may differ depending on when it is calculated. On a self administered questionnaire, asking farm operators to record income can frequently yield inaccurate responses.

Frequently, studies of farm populations report gross sales as an alternative measure of economic well being. It provides a basis of comparing the economic activity of farm households. In an analysis of farm household decision-making, gross sales is an important factor. Previous research has linked gross sales with early adoption of innovations.[8] Farm households which report gross sales of 500,000 dollars, or more, per year will face different decisions and will use different techniques in decision-making than will an operator with gross sales of a much lower level. In part, the difference in the type of decisions considered will be influenced by the ability to tolerate risk. A farm household with a high level of gross sales can tolerate more risk, and will contemplate more risky decisions, than will a farm with a lower level of gross sales. The distribution of gross sales, as reported by the respondents, is presented in Table 8. The category most frequently recorded by respondents was the gross sales range from $25,000 to $49,999 with 20.5 percent of the respondents reporting that category.

TABLE 8.
GROSS SALES REPORTED BY RESPONDENTS
(percentage of respondents)

Gross Sales Categories	1988 Survey (n = 259)
Under $2500	6.2
From $2500 to $9999	18.8
From $10000 to $24999	17.8
From $25000 to $49999	20.5
From $50000 to $99999	18.5
From $100000 to $249999	14.7
From $250000 to $499999	3.5
$500000 and over	0.4

Farm Size

Farm size provides another indicator of the level of economic activity of a farming operation. This is essential to the analysis to provide a basis for economic comparison of respondents. Farm size also affects the decision-making processes of a farm household. Similar to gross sales, a farm household with 160 acres will face different decisions, and use different decision processes, than a farm household with 4000 acres. For example, an operator with a very large farm may be more likely to acquire more land with little consideration. Whereas the acquisition of the same amount of land, by a farm operator with little land, will likely occur only after a lengthy decision process.

The farm households in the sample reported operating on an average of 568.9 acres. The range of total acres operated was from 5 acres to 4086 acres. The modal category was 160 acres which corresponds to one quarter section. The mode is much lower than the mean because there were a few respondents in the study who reported farming on very large numbers of acres. These few extreme responses cause the mean, which represents the average response, to be much higher than the mode, which represents the most frequent response.

The respondents were asked to identify, of the total acres operated on, how many were rented and how many were owned. The mean number of acres rented was 383.5 with the range being from 10 acres to 3500 acres. The modal category was, again, 160 acres. The disparity between the mean and the mode is caused by a few extremely large responses.

The mean number of acres reported as owned by farm households in the sample was 378.8 with the range being from 5 acres to 2586 acres. The modal category of 160 acres, again was much different from the mean due to a few extreme responses.

Farm Type

To allow for comparison with other studies, the participants were asked to record the type(s) of agricultural enterprises engaged in their operation. The results are presented in Table 9. The enterprises that were reported with the greatest frequency are hay (n=179), pasture (n=162), barley (n=159), cow calf (n=145) and oats (n=131).

TABLE 9.

TYPES OF ENTERPRISES REPORTED IN THE STUDY

(percentage of respondents)

ENTERPRISES	Number of Operations	Percent of Total Operations	Number of Units	Mean Number of Units
Hay in Acres	179	66.1	31645	176.8
Pasture in Acres	162	59.8	25137	156.6
Barley in Acres	159	58.7	30391	191.1
Cow/Calf Number	145	53.5	8865	61.1
Oats in Acres	131	48.3	10160	77.6
Feeder Cattle Number	78	28.8	3739	47.9
Fallow in Acres	76	28.0	5565	73.2
Horses Number	62	22.9	478	7.7
Oilseeds in Acres	54	19.9	8035	148.8
Wheat in Acres	53	19.6	5381	101.5
Poultry Number	42	15.5	18695	445.1
Pigs Number	35	12.9	5743	164.1
Dairy Cows Number	29	10.7	1082	37.3
Dairy Calves Number	26	9.6	1042	40.1
Other Field Crops in Acres	20	7.4	2843	142.2
Other Grains in Acres	15	5.5	1234	82.3
Sheep Number	10	3.7	133	13.3
Sod/Nursery in Acres	7	2.6	188	26.9
Greenhouses in Square Feet	3	1.1	664	221.3

Attitudes and Behaviors of Farm Operators

In order to assist in the testing of the hypotheses, the attitudes and behaviors of the respondents were studied. Information was collected about involvement in farm organizations, personal orientation and risk preference.

Involvement in Farm Organizations

The definition of a voluntary association is "...an organized group of persons (1) that is formed in order to further some interest of its members; (2) in which membership is voluntary in the sense that it is neither mandatory nor acquired through birth; and (3) that exists independently of the state."[9] People belong to voluntary associations for a number of reasons such as social integration, and the furthering of common interests.[10] Organizations also provide a medium for the dissemination of information. People with more involvement in organizations are more likely to seek out information, as individuals or collectively, which will influence their decisions. A study by Dean, Aurbach, and Marsh demonstrated that farm operators with more participation in formal organization exhibited more 'rationality'. In the study, rationality was defined as "...the use of deliberation, planning, and the best available sources of information and advice in arriving at decisions as a means of achieving maximum ends."[11]

The respondents were asked to identify any organizations that they have been participants in, and to record the amount of involvement. The percentages of respondents in each category for each organization are presented in Table 10. The results indicate that the majority of respondents are members in United Farmers Association (68.3 percent) and the Alberta Wheat Pool (59.4). Despite the high percentage of membership in these two organizations, few respondents reported that they have ever been involved as officers, or that they attend meetings regularly. Respondents indicated the most involvement as officers and regular attenders in church groups and community associations. Overall, the number of people who indicated that they attend meetings on a regular basis in those organizations that they are members of is very small.

A score used to summarize respondents' involvement in farm related organizations was derived by assigning a numerical value of one for a response in each of the response categories. For each respondent, the responses are summed, and a score was derived. The scores ranged from zero to twenty-five. The mean score was 4.75. The most frequently recorded score, the mode, was 2.

TABLE 10.
RESPONDENTS INVOLVEMENT IN ORGANIZATIONS
(Percent in Each Category)

Organization	Member	Officer: Currently	Officer: Past	Regular Attender
United Farmers Association	68.3	0.7	1.1	3.0
Alberta Wheat Pool	59.4	1.8	1.8	7.7
Church Group	27.3	7.4	6.6	11.1
Community Association	23.6	8.1	8.5	10.0
United Grain Growers	21.4	0.7	0.4	2.2
Cattlemen's Association	16.6	0.4	0.7	1.5
Unifarm	12.9	1.1	3.0	2.2
Agricultural Society	12.9	4.1	3.7	3.7
Alberta Pork Producers Dev. Corp.	12.2	0	0	0.7
Alberta Dairy Pool	8.1	0	0.4	0
Commodity Groups (Unspecified)	7.0	1.5	0.4	2.6
4-H	5.2	2.2	5.5	2.6
National Farmers Union	3.0	0	0.7	0.4
Women's Institute	3.0	0	0.4	0.7
Barley Growers Association	3.0	0	0.4	0.4
Women of Unifarm	2.6	0.4	0.4	0.7
Christian Farmers Federation	0.7	0.4	0	0

A significant number of respondents identified organizations to which they belonged which did not appear on the list provided. A total of 107 additional organizations were mentioned by respondents. These organizations were separated into categories of agricultural/business, social/recreational, religious, community service, and political organizations. The agriculture/business category is a broad category that contains commodity related groups, farm business groups, and general farm organizations. The social/recreational category includes general recreation groups, and social and educational clubs. The religious organizations included individual church groups and broader

Christian organizations. Community service organizations involves groups whose aim is voluntary service to the community. The political organization category pertains to membership in political parties.

As shown in Table 11, the majority of respondents identified agriculture/business organizations, specifically, commodity related groups. The social/recreational and community service categories are the next most popular organization categories. A listing of these organizations and the number of respondents who mentioned them is provided in Appendix E.

TABLE 11.
TYPES OF ADDITIONAL ORGANIZATIONS MENTIONED BY RESPONDENTS

Organization Type	Frequency
Agriculture/Business Organizations	92
Social/Recreational Organizations	26
Religious Organizations	3
Community Service Organizations	19
Political Organizations	2

Agreement with Goal Statements

An understanding of goals and values is essential for an analysis of the process by which decisions are made. The sum of the values held by the individual comprises his/her value orientation. Value orientations govern the ways in which the individual thinks and acts and, consequently, the decisions that they make. Value orientations tend to be relatively unchanging; they are simply the way in which the individual approaches life. The two value orientations being considered in this study are "business" and "social" orientations. A farm operator with a "business" orientation is someone who views their farm mainly as a business, financial goals are of central prominence in their thinking. A "social" orientation identifies farm operators who are more concerned with farming as a lifestyle, and they are concerned with more social aspects of life.

TABLE 12
REPORTED AGREEMENT WITH GOAL STATEMENTS

Goal Statement	1 Strongly Disagree	2	3	4	5 Strongly Agree	Mean	Standard Deviation
1). (Healthy Lifestyle) One of my main reasons for farming is to be able to provide a healthy lifestyle for my family	4.7	5.0	14.7	18.2	57.4	4.19	1.15
2). (Business Growth) A major goal for me is to have my net worth increase from year to year.	5.1	7.9	19.0	26.1	41.9	3.92	1.18
3). (Labour Income) One of my major goals is to operate a farm business that will pay a wage similar to any other business.	5.1	7.1	23.9	18.8	45.1	3.92	1.20
4). (Investment Income) A major concern of mine is to have a modern farm business that will give a return on investment comparable to any other business.	6.0	9.9	15.9	28.6	39.7	3.86	1.21
5). (Continuity) It is very important to me that the farm stay in the family for at least the next generation.	10.7	13.8	19.4	19.4	36.8	3.58	1.38
6). (Leisure Time) A major goal of mine is to have time available to spend in leisure activities.	10.6	15.4	31.5	24.0	18.5	3.24	1.23
7). (Social Recognition) It is important to me to be recognized as a top farmer in my area.	29.1	16.9	28.3	15.0	10.6	2.61	1.33
8). (Financial Security) It is very important to me to make profitable investments in my farm business by using borrowed money.	40.7	19.0	17.3	10.5	12.5	2.35	1.42

To study the business and social value orientations, the respondents were presented with a variety of goal statements and asked to state their level of agreement with each statement on a Likert type scale. The level of agreement indicated with statements about specific goals provides insight into the personal values held by the individual.

The goal statements and the percentage of responses in each category are presented in Table 12. The statement relating to the goal labelled "Healthy Lifestyle", elicited the largest amount of agreement (75.6 percent in agreement). The mean value for this statement is 4.19, and the standard deviation is 1.15. As the mean value of agreement decreases, there is more variation in response. The goal statement with the lowest mean value for agreement is "Financial Security", with a mean of 2.35 and a standard deviation of 1.42. A possible explanation for the low level of agreement with the goal of financial security is that the statement, "It is very important to me to make profitable investments in my farm business by using borrowed money", has two distinct components which may have caused confusion to the respondent. It is possible that the respondent could have agreed with the goal of making profitable investments, yet could have disagreed with using borrowed money to make those profitable investments.

To test the validity of the Likert scale used to measure the level of agreement with the goal statements, the respondents were also asked to indicate the three goal statements that were of the most importance to them in their operation at the current time.

The frequency of responses to each of the three ranking questions are presented in Table 13. The goal of being able to provide a healthy lifestyle for family was ranked as the most important goal by 30.0 percent of the respondents. The goals of making "Social Recognition" and "Financial Security" were consistently identified as being important to very few respondents. These results, shown graphically in Figure 4., correspond closely with those gathered from the Likert scales used to elicit the level of agreement.

TABLE 13.
RANKING OF THREE MOST IMPORTANT GOALS
(percentage of respondents)

Goal	Goal Ranked Most Important (n=247)	Goal Ranked Second Most Important (n=246)	Goal Ranked Third Most Important (n=235)
Healthy Lifestyle	30.0	16.7	21.3
Labour Income	25.9	16.3	11.9
Continuity	13.4	12.6	12.3
Business Growth	12.1	19.9	15.3
Investment Income	10.1	21.1	14.5
Leisure Time	6.1	5.7	17.4
Social Recognition	1.2	2.0	3.8
Financial Security	1.2	5.7	3.4

Personal Orientation

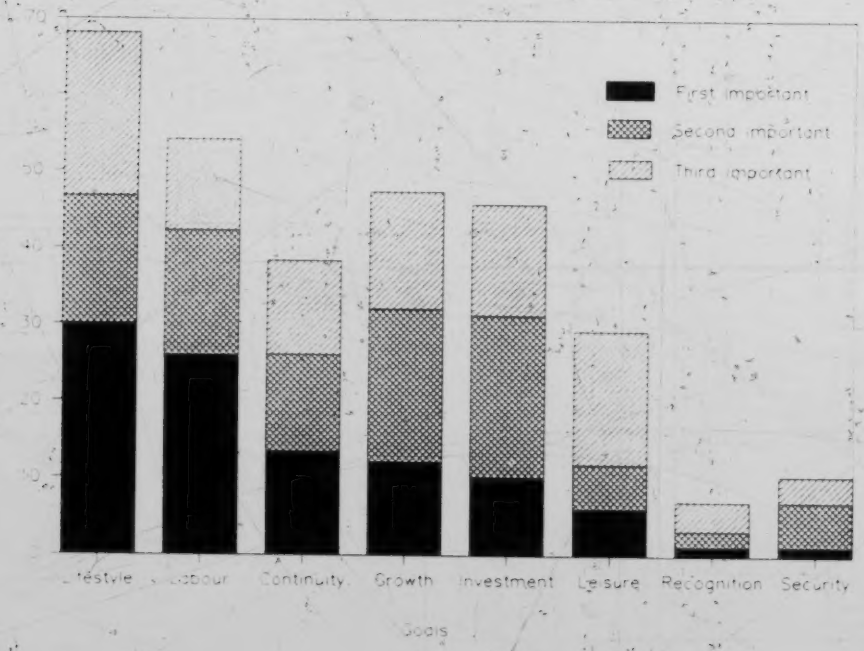
To facilitate the testing of the hypotheses, and to identify the respondent's personal value orientations, the goal statements were classified into two categories. The first category contains the statements that embody a financial or "business" orientation. Agreement with the goal statements labelled "Labour Income", "Financial Security", "Business Growth", and "Investment Income" indicates a business orientation. The alternative category contains statements labelled "Continuity", "Healthy Lifestyle", "Social Recognition", and "Leisure Time" which can best be classified as being of a "social" orientation.

The point value, out of the maximum of 5, for each goal statement was summed and scores for both business and social orientations were derived. The mean value on the scale of business orientation was 13.74, with the range being from 4 to 20. The mean value for social orientation was 13.2, which is very similar to the business orientation. The range of scores for social orientation was from 4 to 20.

A personal orientation score was derived by evaluating respondent's scores on the business and social orientation scales. Initially, it was determined that if the business orientation score was greater than the social orientation score, the personal orientation was considered to be "business orientation". Conversely, if the social orientation score was greater than the business orientation score, the personal

FIGURE 4.

RANKING OF IMPORTANCE OF GOAL STATEMENTS



orientation was considered to be "social orientation". In the case of a tie, the personal orientation score was considered to be "neutral". This method for evaluating personal orientation was based on the assumption that the two orientations were conflicting values. As the study evolved, it became apparent that an individual can be quite high on the scale of social orientation as well as the scale for business orientation. Based on these findings, the conceptualization of personal orientation was changed to reflect the potential complementarity of the two orientations.

The measure of personal orientation that was used in the study is comprised of four categories to accommodate four personal orientation scenarios. The first scenario is where the respondent has high scores on both business and social orientation scales (A high score is considered to be equal to or greater than a value of 15). The second possible scenario is where the respondents has a high score on the business orientation scale and a low score on the social orientation scale. The third scenario occurs when a respondent has a low business orientation score and a high social orientation score.

The final scenario exists when the respondent has a low score on both of business and social orientations. The frequency table for the personal orientation of respondents in shown in Table 14. The modal category is that where the respondents scored low on both business and social orientations.

TABLE 14.
PERSONAL ORIENTATION OF RESPONDENTS

Orientation	Frequency	% of respondents
High Business/High Social Orientation	55	21.4
High Business/Low Social Orientation	62	24.1
Low Business/High Social Orientation	45	17.5
Low Business/Low Social Orientation	95	37.0
Total	257	100

Risk Evaluation

To determine the level of respondent's propensity for risk, a series of five statements related to attitudes toward risk were presented. The respondents were then asked to identify their level of agreement with the statements, on a Likert Scale. The responses to the risk statements are summarized in Table 15.

The statements which evinced the strongest agreement were oriented toward a low risk preference. The highest mean score calculated was 2.84 for the statement of: "I would rather stay with a proven practice than switch to a new one even if the new one looks more profitable." The standard deviation for this statement is 1.28. The lowest mean score was derived for the statement of: "I tend to take more financial risks in my farming operation than do most other farmers in my community." The mean score for this statement is 2.29, with the standard deviation of 1.19.

Score of Risk Preference

To allow for inclusion in further analysis, a summary score was derived, from the responses to the attitude statements on risk preference, which will be referred to as Risk Score. This score was derived by assigning numerical values to each of the response categories, with the numerical value increasing as the level of agreement moved from disagree to agree. The numerical values assigned to

risk statements number 1 and 2 are as follows: "Strongly Disagree" is equal to 1; "Strongly Agree" is equal to 5; and the three agreement categories between "Strongly Disagree" and "Strongly Agree" were given values of 2, 3 and 4. The values assigned to risk statements number 3, 4 and 5 are as follows "Strongly Agree" is equal to 1; "Strongly Disagree" is equal to 5; and the three agreement categories between "Strongly Agree" and "Strongly Disagree" were given the values of 2, 3 and 4. The risk score values ranged from 1 to 23, with the mean being 12.33.

Managerial Consideration Score: The Components

The decision-making process is cyclical in nature and, as a consequence, is difficult to quantify. However, specific components of the process are amenable to measurement. In this study, the decision-making process was viewed from the perspective of the amount of managerial considerations that the decision maker exhibits at various stages throughout the process of decision-making. Considerations that farm operators make in the decision-making process that are seen to reflect a degree of managerial ability are those related to the search for information, perception of important factors in farm management, use of farm records, and the consideration of basic economic principles in the process of decision-making.

The specific components of the questionnaire that are included in the managerial consideration score are: information contacts, use of microcomputer, methods of keeping financial records, use of financial records, perceived importance of cropping considerations, frequency of soil test, frequency of profit calculation, and reasons for and techniques used in making asset acquisition decisions. The data collected for these components, presented in the following sections, were used only for the purpose of deriving the managerial consideration score.

TABLE 15.
RISK STATEMENTS OF RESPONDENTS[a]

Risk Statement	1 Strongly Disagree	2	3	4	5 Strongly Agree	Mean	Standard Deviation
1. I tend to try new farming practices before my neighbors do.	21.0	21.0	30.6	19.0	8.3	2.73	1.23
2. I tend to take more financial risks in my farming operation than do most other farmers in my community.	34.5	22.0	28.6	9.4	5.5	2.29	1.19
	5 Strongly Disagree	4	3	2	1 Strongly Agree		
3. I would rather stay with a proven practice than switch to a new one even if the new one looks more profitable.	12.4	19.0	27.9	21.7	19.0	2.84	1.28
4. Even if I might be able to make more money by specializing, I would rather diversify my operation to reduce risk than specialize in one area.	10.5	13.6	22.5	29.5	24.0	2.57	1.28
5. Even if a speculative stock paid better, I would still rather invest my money in a savings account.	9.1	9.5	21.0	25.4	34.9	2.32	1.29

a) Note: Risk statement numbers 3, 4 and 5 were phrased so that "Strongly Agree" was equivalent to a low risk preference, and "Strongly Disagree" was equivalent to a high risk preference. To permit the inclusion of these statements in the calculated Risk Score, they were recoded so that a "1" on statements 3, 4 and 5 is of the equivalent risk preference to a "1" on statements 1 and 2.

Information Contacts

The search for information is a crucial element of the decision-making process. The decision maker attempts to gather information about the consequences of alternative plans of action related to the decision. This information assists the decision maker by alerting him/her to any possible negative outcomes of a decision and thus reducing risk. Research has shown a relationship between information seeking behavior and various factors related to the decision-making process such as innovation adoption behavior and managerial ability.[12,13]

The survey respondents were asked to report the frequency with which they contacted various communicating agents for farm management related information. The information sources were divided into the categories of mass media, agricultural agencies, commercial sources and other farmers. The mass media category includes newspapers/magazines, television, and radio. The agricultural agencies category includes district agriculturalist, government publications, elevator agent, federal research, county fieldman, district home economist, and universities/colleges. The commercial sources category includes tax advisors, suppliers, bankers, lawyers and bankers.

As presented in Table 16., the majority of respondents indicated that they had at least one contact per year with the mass media. Newspapers/Magazines was identified by 97.3 percent of respondents, radio by 93.8 percent of respondents and television was listed by 87.0 percent of respondents. The large number of people who reported contact with the mass media was not unexpected given the large presence that mass media has throughout society.

A large number of respondents reported contact each year with agricultural agencies. District agriculturalists were contacted by 84.5 percent and government publications were contacted by 83.9 percent. Fewer respondents reported contact with federal research (52.9 percent), county fieldmen (49.8 percent), district home economists (41.5 percent) and universities/colleges (30.7 percent).

Commercial sources were contacted by a significant number of respondents. Most reported contact with tax advisors (82.3 percent), elevator agents (81.7 percent), suppliers (77.2 percent) and bankers (61.4 percent). Fewer respondents indicated contact with lawyers (27.5 percent) and brokers (14.8 percent). There was also a significant amount of contact with other farmers. Friends/Neighbors was mentioned by 90.6 percent of the respondents.

TABLE 16
RESPONDENT'S CONTACTS PER YEAR WITH INFORMATION SOURCES
(percentage of respondents)

Information Source	At Least One Contact	No Contact	Number of Responses
Newspapers/Magazines	97.3	2.7	259
Radio	93.8	6.3	256
Friends/Neighbours	90.6	9.4	244
Television	87.0	13.0	271
District Agriculturalist	84.5	15.5	252
Government Publications	83.9	16.1	252
Tax Advisors	82.3	17.7	249
Elevator Agent	81.7	18.3	242
Suppliers	77.2	22.8	246
Bankers	61.4	38.6	246
Federal Research	52.9	47.1	238
County Fieldman	49.8	50.2	233
District Home Economist	41.5	58.5	236
Universities/Colleges	30.7	69.3	238
Lawyers	27.5	72.5	236
Brokers	14.8	85.2	237

In addition, respondents recorded extra information sources in the "other" category. Three agricultural agency sources: Canadian Wheat Board, Alberta Wheat Pool and Cattle Commission; and one commercial source: Farm Management Consultant were recorded. One respondent recorded that he/she gained farm management information by visual observations on trips or vacations.

The actual frequency with which respondents consulted the various sources of information is presented in Table 17. The frequency of the contact with information sources differs depending on the "necessity" of frequent contact. For example; 31.4 percent of respondents indicated that they contacted newspapers and magazines more than once per week, while zero percent of respondents

indicated that they contacted tax advisors more than once per week. This does not necessarily mean that farm households rely on newspapers for more farm management information than they rely on tax advisors. Rather it means that it is only necessary to contact tax advisors once or twice per year, while it is necessary to contact newspapers or magazines much more frequently. Thus, it is important to consider the type of information source when interpreting the data in Table 17.

To derive a score, for use in analysis, that measures the quantity and frequency of information contacts, numerical values were assigned to each of the response categories, from the questionnaire, with the numerical value increasing as the frequency of contact increased. The numerical codes are as follows:

a) Never	=0
b) About Once Per Year	=1
c) About 2 to 6 Times Per Year	=2
d) About Once Per Month	=3
e) About 2 to 3 Times Per Month	=4
f) Once Per Week	=5
g) More than Once Per Week	=6

The fact that, by nature of the type of information source, certain sources are contacted much less frequently than others, does not negate the value of the summary information contact score. Despite the differences in the types of information sources, an individual with a high information contact score is still more aggressively seeking information than an individual with a low information contact score.

The information-contact scores ranged from one to sixty-three, with the mean being 27.48. To permit later inclusion as part of the managerial consideration score, the information score was then condensed into three categories. Scores ranging from one to twenty were assigned a value of one, corresponding to low managerial consideration. The range of scores from twenty-one to forty were assigned a value of two. The scores ranging from forty-one to sixty-three were assigned a value of three which corresponds to high managerial consideration. The distribution of results are presented in Table 18.

TABLE 17.
FREQUENCY OF CONTACTS WITH INFORMATION SOURCES
(percentage of respondents)

Information Source	Frequency of Contacts							
	Never	Once Per Year	2-6 Times Per Year	Once Per Month	2-3 Times Per Month	Once Per Week	More Than Once Per Week	No Response
Newspapers/Magazines	2.6	3.7	7.0	16.2	15.5	31.4	19.2	4.4
Radio	5.9	1.8	3.3	3.0	5.9	12.5	62.0	5.5
Friends/Neighbours	8.5	6.6	29.2	19.2	14.0	7.4	5.2	10.0
Television	11.8	4.1	8.5	4.8	6.3	15.9	39.9	8.9
District Agriculturalist	14.4	27.3	32.5	13.3	4.8	0.7	0	7.0
Government Publications	14.4	20.3	25.8	17.3	6.6	4.4	0.4	10.7
Tax Advisors	16.2	44.6	26.6	3.0	1.5	0	0	8.1
Elevator Agent	17.0	16.6	30.6	12.9	9.6	4.1	2.2	7.0
Suppliers	20.7	18.1	24.7	14.4	8.5	3.7	0.7	9.2
Bankers	35.1	23.6	19.2	10.0	2.2	0	0.7	9.2
Federal Research	41.3	22.1	14.4	6.3	3.3	0.4	0	12.2
County Fieldman	43.2	27.3	11.4	1.8	1.1	0.7	0.4	14.0
District Home Economist	50.9	20.7	11.1	1.8	1.8	0.7	0	12.9
Universities/Colleges	60.9	16.2	5.2	3.7	1.8	0	0	12.2
Lawyers	63.1	20.3	3.7	0	0	0	0	12.9
Brokers	74.5	7.0	2.6	1.5	1.5	0	0.4	12.5

TABLE 18.
INFORMATION CONTACTS: MANAGERIAL CONSIDERATION SCORE

Number of Contacts	Managerial Consideration Score	% of Respondents
1 to 20 Contacts	1	25.7
21 to 40 Contacts	2	62.8
41 to 63 Contacts	3	11.5
Total	269	100

Use of Microcomputer

As computer technology continues to develop at an increasingly fast pace, the applicability of that technology is also increasing. Cursory analysis of farm management magazines indicates that farm operators are inundated with information about the benefits of computerization of their operation. Software programs are being promoted that will assist the farmer in virtually every aspect of his or her operation.

Previous research has identified that few farm operators have incorporated computer technology in their operations. A 1983 study of Alberta farmers found that only 1.1 percent of farm operators in a random sample used a microcomputer for accounting purposes.[14] A recent study in the United States found similar results, with less than three percent of farmers using computers for financial record keeping.[15]

A large majority of respondents in the survey did not own or use a microcomputer to assist them in their keeping of records. Out of 268 responses, nineteen (7.1 percent) reported that they keep their records on a microcomputer, while 249 (92.9 percent) did not. The percentage of computer users is high compared to the 1986 Census data which indicates that 2.1 percent of farmers in the Northwest Region used microcomputers.

Because the act of maintaining farm records on a computer is another method of keeping financial records, the use of microcomputers was incorporated into the managerial consideration

score as part of the Method of Keeping Financial Records component. Those respondents who reported using a microcomputer in their record keeping received a managerial consideration score for the method of keeping financial records of 3.

Method of Keeping Financial Records

Respondents were asked to identify the type of financial records that they kept. All respondents kept some form of financial records, with the modal category being 'single entry' record books.

The results, presented in Table 19., indicate a number of respondents who recorded 'Accountant' and 'Computer Program' in the "Other" category. Interpretation of the "Other" category may be misleading as the actual number of respondents who use these record keeping techniques may be higher than recorded. However, since the category was not a suggested option, not all respondents would have considered them, and consequently would not have recorded them.

TABLE 19.
TYPES OF FINANCIAL RECORDS MAINTAINED BY RESPONDENTS

Type of Record	Frequency	% of respondents
Bills and Receipts Only	85	31.6
Single Entry Records	124	46.1
Double Entry Records	49	18.2
Other	11	4.1
Total	269	100

The financial records data were further analyzed to allow for their inclusion in the managerial score. The results are presented in Table 20. Responses to "Bills and Receipts Only" were assigned a managerial score of one. A managerial score of two was assigned to "Single Entry Records" responses. A managerial score of three was assigned to responses in the categories of "Double Entry Records" and "Other". In addition, as outlined previously, positive responses to the question: "Do you use a microcomputer to assist you in your record keeping?" were incorporated as a value of three in the managerial consideration score for types of financial records kept.

TABLE 20.
TYPES OF FINANCIAL RECORDS: MANAGERIAL CONSIDERATION SCORE

Managerial Consideration Score	Frequency	% of Respondents
1 - Low Managerial Consideration	83	31.0
2 - Medium Managerial Consideration	116	43.3
3 - High Managerial Consideration	69	25.7
Total	268	100

Use of Financial Records

In addition to the types of records kept, respondents were asked what they used their financial records for. It should be noted that the percentages are not cumulative, as respondents were permitted to record more than one response to the question. As shown in Table 21., the modal response was that records were used for income tax calculation.

TABLE 21
USE OF FINANCIAL RECORDS BY RESPONDENTS

Use of Records	Frequency	% of respondents
Income Tax Calculation	262	96.7
Estimating Profit	148	54.6
Operation Evaluation	96	35.4
Next Year's Plans	95	35.1
Enterprise Evaluation	85	31.4
Loan Application	82	30.3
Government Program Application	63	23.2
Other	4	1.5
No Records Used	0	0

The responses to the question on the uses of financial records were recoded into the managerial consideration score. If the respondent recorded "Records Not Used" or "Income Tax Calculation" or "Government Program Application" a managerial score of one, corresponding to low managerial consideration was assigned. Responses to any one of "Loan Application" and "Estimating Profit" were assigned a managerial score of two. A managerial score of three was assigned to responses to any one of "Next Years' Planning", "Operation Evaluation", and "Enterprise Evaluation". The distribution of the scores is presented in Table 22.

TABLE 22
USE OF FINANCIAL RECORDS: MANAGERIAL CONSIDERATION SCORE

Managerial Consideration Score	Frequency	% of Respondents
1 - Low Managerial Consideration	71	26.4
2 - Medium Managerial Consideration	38	14.1
3 - High Managerial Consideration	160	59.5
Total	269	100

Importance of Cropping Considerations

Respondents were asked to identify what crops they planted in their cropping program for 1987. The respondents were then provided with a series of factors that are related to growing crops and asked to indicate, on a scale from one to five, how important each of these were in relation to their choice of cropping program. The results in Table 23. indicate that the factor of the most importance to respondents in their cropping decisions was past experience with the crops. Also of significant importance to the respondents was the average amount of rainfall. Of little importance to respondents was the past experience of their peers with the specific crops, and the availability of transportation.

TABLE 23
IMPORTANCE OF CROP FACTORS TO RESPONDENTS
(percentage of respondents)

Crop Factor	Not Important At All 1	2	3	4	Very Important 5	Mean	Standard Deviation
1. Past Personal Experience	7.4	3.5	19.9	31.3	37.9	3.88	1.17
2. Average Amount of Rainfall	7.8	6.2	18.3	29.6	38.1	3.84	1.22
3. Length of the Growing Season	6.6	8.2	24.5	23.3	37.4	3.77	1.22
4. Soil Characteristics	7.5	6.0	25.8	25.4	35.3	3.75	1.21
5. Current crop prices	12.8	7.4	17.1	20.6	42.0	3.72	1.40
6. Weed and Disease Problems	9.5	10.3	19.4	22.9	37.9	3.70	1.32
7. Spring Soil Moisture Conditions	9.5	11.1	19.8	19.4	40.3	3.70	1.35
8. Marketing Opportunities	13.8	7.1	16.1	24.0	39.0	3.67	1.41
9. Experience of Peers	22.7	15.9	28.7	16.3	16.3	2.88	1.37
10. Availability of transportation	41.7	14.7	14.7	9.5	19.4	2.50	1.57

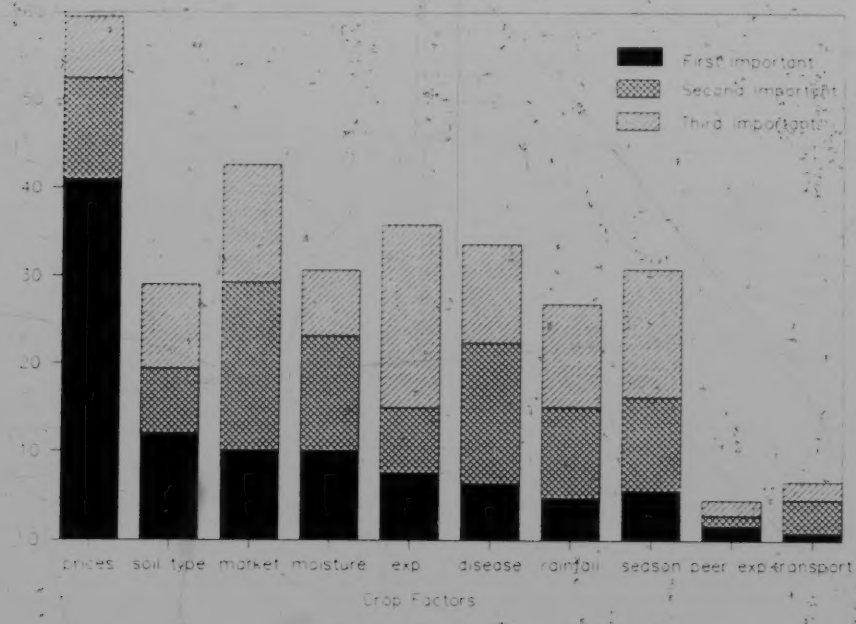
Ranking of Importance of Cropping Considerations

The results of the ranking of the three most important cropping considerations, shown in Table 24. yielded similar results to the scaling of the importance of the factors discussed above. Availability of Transportation and Neighbors Experience with the crops, were consistently ranked among the top three by a small minority of respondents. The consideration of current crop prices was ranked as the most important factor by 41 percent of the people in the sample. The ranking of the three most important crop factors is shown graphically in Figure 5.

TABLE 24.
RANKING OF THREE MOST IMPORTANT CROP FACTORS
(percentage of respondents)

Factor	Factor Ranked Most Important (n=249)	Factor Ranked Second Most Important (n=245)	Factor Ranked Third Most Important (n=239)
Current Crop Prices	41.0	11.4	7.1
Soil Characteristics	12.0	7.3	9.6
ket Opportunities	10.0	19.2	13.4
spring Soil Moisture	10.0	13.1	7.5
Past Personal Experience	7.6	7.3	20.9
Weed/Disease Problems	6.4	15.9	11.3
Annual Rainfall Amount	5.6	10.2	14.6
Length of Growing Season	4.8	10.6	11.7
Neighbors Experience	1.6	1.2	1.7
Transportation Availability	0.8	3.7	2.1

FIGURE 5. RANKING OF IMPORTANCE OF CROP FACTORS



Crop Consideration Score

Responses to the questions on cropping considerations were further analyzed. The crop factors were grouped into the three categories of agronomic, market and experiential groups. A score was then calculated from the reported importance of each category of crop factors. The score was derived by assigning numerical values to each of the response categories, with the numerical value increasing as the level of importance moved from "Not Important At All" to "Very Important"

The components of the agronomic category are related to characteristics of the physical geography of the farm. The agronomic factors are soil characteristics, spring soil moisture, weed/disease problems, annual rainfall amount and length of the growing season. The range of scores of the importance of agronomic conditions was from four to twenty-five, with the mean being 18.28.

To incorporate the agronomic category score into the managerial consideration analysis, the score was categorized. Scores ranging from four through ten were assigned a managerial consideration value of one, corresponding to low managerial consideration. A value of two was assigned to agronomic category scores ranging from eleven through eighteen. Scores ranging from nineteen through

twenty-five were assigned a managerial consideration score of 3, corresponding to high managerial consideration. The distribution of managerial consideration scores for the responses to the agronomic category are presented in Table 25.

TABLE 25.
IMPORTANCE OF CROP FACTORS: MANAGERIAL CONSIDERATION
(percentage of respondents)

	Managerial Consideration Score		
Index	1	2	3
Agronomic Conditions	8.0	37.2	54.8
Market Conditions	15.4	42.1	42.5
Role of Experience	15.7	46.0	38.3

The market category consists of factors, external to the farm operation, which can have a significant impact on the farm operation. The market factors are current crop prices, market opportunities and the availability of transportation. The scores ranged from two to fifteen, with the mean being 9.73.

To allow for inclusion in the managerial consideration score, the market category was recoded into the categories which follow. Market category scores ranging from one to five were assigned a managerial consideration value of one. Scores ranging from six through ten were assigned a managerial consideration value of two. A managerial consideration value of three was assigned to scores ranging from eleven to fifteen. The distribution of scores is also shown in Table 25.

The experiential category consists of personal experience and the experience of neighbors with crops. The scores ranged from two to ten, with the mean being 6.72.

Similar to the agronomic and market categories, the experiential category was divided into managerial consideration values. Experiential scores ranging from two through four were assigned a managerial value of one. Scores ranging from five through seven were assigned a managerial value of two. A managerial value of three was assigned scores that ranged from eight through ten. The distribution is presented in Table 25.

Fertilizer Decision

A question was posed that asked on what considerations was the decision of how much fertilizer to apply based. The results are presented in Table 26. The modal category was "Experience", with 43.2 percent of the respondents indicating that their decision was based on past general experience with fertilizers. It should be noted that the percentages are not additive, as respondents were permitted to record more than one response to the question.

TABLE 26.
CRITERIA USED BY RESPONDENTS IN FERTILIZER DECISION

Decision Criterion	Frequency	% of respondents
Experience	117	43.2
None Applied	73	26.9
Soil Test	73	26.9
As Much as Could Afford	56	20.7
Records	56	20.7
Dealer Aided Decision	41	15.1
Same Amount as Last Year	40	14.8
Family/ Neighbor Advice	14	5.2
Other	7	2.6

The fertilizer decision question was not included in the final analysis of the managerial consideration score because of the significant number of respondents (26.9 percent) who reported that they had not used fertilizer. Since the reason for this decision could not be evaluated, it was deemed impossible to assign a managerial consideration value to this response.

Frequency of Soil Test

Table 27. presents the results of the frequency of soil testing. The majority of respondents who reported the frequency with which they performed soil tests, indicated that they never performed them. This may be influenced by the soil types present in the region. One respondent noted that: "Variable soil conditions in this area nullify soil tests" (Respondent 135).

Of those respondents who reported that they did soil tests, the most frequent response was that a soil test was performed once every three years (23.9 percent).

TABLE 27.
REPORTED FREQUENCY OF SOIL TESTING BY RESPONDENTS

Soil Test	Frequency	% of respondents
Never	95	37.3
Once Every 3 Years	61	23.9
Once Per Year	36	14.1
Once Every 2 Years	29	11.4
Less Than Once Every 10 Years	11	4.3
Every 6 to 10 Years	9	3.5
Every 5 Years	8	3.1
Every 4 Years	4	1.6
More Than Once Per Year	2	0.8
TOTAL	255	100

The frequency with which farm operators performed soil tests was analyzed to derive the managerial consideration score. The results are presented in Table 28. Those who performed soil tests once per year or more were assigned a managerial consideration score of three, corresponding to high managerial consideration. Those who performed a soil test once every two years or every 3 years received a score of two. Respondents who reported performing soil tests once every four or more years received a score of one, which corresponds to low managerial consideration.

TABLE 28.
FREQUENCY OF SOIL TESTING: MANAGERIAL CONSIDERATION SCORE

Managerial Consideration Score	Frequency	% of Respondents
1 - Low Managerial Consideration	127	49.8
2 - Medium Managerial Consideration	90	35.3
3 - High Managerial Consideration	38	14.9
Total	255	100

Frequency of Profit Calculation

Respondents indicated that they performed profit calculation exercises with greater frequency than they did soil tests. In Table 29, it can be seen that the majority of respondents (60.1 percent) indicated that they calculated profit once per year. However, 15.3 percent reported that they never calculated profit.

TABLE 29.
REPORTED FREQUENCY OF PROFIT CALCULATION BY RESPONDENTS

Profit Calculation	Frequency	% of respondents
Once Per Year	151	60.6
More Than Once Per Year	56	22.5
Never	38	15.3
Once Every Two Years	2	0.8
Once Every Three Years	1	0.4
Once Every Four Years	1	0.4
TOTAL	249	100

The responses to the question on the frequency of profit calculation were coded into the managerial consideration score. Those who calculated profit once per year or more were assigned a managerial consideration score of three, corresponding to high managerial consideration. A profit

calculation frequency of once every two, three or four years was coded as two. Those who reported that the never calculated profit received a score of one, corresponding to low managerial consideration. The distribution of scores is presented in Table 30.

TABLE 30.
FREQUENCY OF PROFIT CALCULATION: MANAGERIAL CONSIDERATION SCORE

Managerial Consideration Score	Frequency	% of Respondents
1 - Low Managerial Consideration	38	15.3
2 - Medium Managerial Consideration	4	1.6
3 - High Managerial Consideration	207	83.1
Total	249	100

Reasons For Decision to Acquire Asset

Respondents were asked to consider their most recent capital asset acquisition decision. They were also asked to identify the conditions or situations that first made them realize that they needed such an asset. The results, presented in Table 31. indicate that the most frequently reported reason was that the new asset would make the operation more efficient.

It should be noted that the percentages are not cumulative, as respondents were permitted to record more than one response to the question. The most frequent response in the "Other" category led to the creation of a new category of "Spare Money Available For Purchase". Since it was not a category choice provided to all respondents, caution should be exercised in the interpretation of this as a distinct category. It is impossible to determine how many respondents would have recorded this category had it been suggested to them. However, it is of importance, and should be noted because so many of the respondents (9.6 percent) considered it important enough to record in the other category.

The responses to the questions about the reasons for the decision to acquire a new asset were analyzed for later inclusion in the managerial consideration score. If the respondent recorded any one of "Neighbor had Asset" or "No Reason, or "Spare Money Available as a reason, and no other responses were recorded, a managerial consideration value of one was assigned. If the respondent recorded that the decision was made because of an urgent situation which "Forced Acquisition" or that the decision

TABLE 31.
CRITERIA IN ASSET ACQUISITION DECISION

Decision Criterion	Frequency	% of respondents
New Asset Would Make Operation More Efficient	120	44.3
Forced to Acquire (Breakdown)	94	34.7
Operation Expanded	72	26.6
Tax Reasons	35	12.9
Other: Spare Money Available	26	9.6
Regular Purchase	25	9.2
No Reason	9	3.3
Neighbor Had Asset	1	0.4

was made because it was a "Regular Purchase", or for "Tax Reasons" or because the "Operation Expanded" a managerial consideration value of two was assigned. If response to "New Asset Would Make My Operation More Efficient" was recorded, the respondent was assigned a managerial consideration score of three. The distribution of responses is shown in Table 32.

TABLE 32.
CRITERIA IN ASSET ACQUISITION: MANAGERIAL CONSIDERATION SCORE

Managerial Consideration Score	Frequency	% of Respondents
1 - Low Managerial Consideration	23	9.1
2 - Medium Managerial Consideration	176	69.3
3 - High Managerial Consideration	55	21.7
Total	254	100

Techniques Used in Asset Acquisition Decision

Further to the previous question about the decision to acquire an asset, the respondents were asked to record what techniques they used in reaching the decision to acquire or not to acquire the asset under consideration. The most frequently recorded category, as shown in Table 33., was that the decision was reached after an estimation of the costs and benefits of acquiring the asset (46.5 percent). Again, these categories are not additive, as the respondents were permitted to record more than one category.

TABLE 33
TECHNIQUES USED IN ASSET ACQUISITION DECISION

Decision Technique	Frequency	% of respondents
Estimation of Costs and Benefits	126	46.5
Urgent Situation	65	24.0
Tax Reasons	45	16.6
Other: Functionality of New Asset	44	16.2
Bank Approval	34	12.5
Payback Analysis	23	8.5
Net Present Value Calculation	15	5.5
Formal Partial Budget	12	4.4

The responses to the questions on the techniques used in the decision to acquire, or to not acquire, were analyzed for later inclusion in the managerial consideration score. If the respondent recorded that the decision to acquire the asset was based purely on an "Tax Reasons", "Bank Approval", "Functionality of New Asset", or "Urgent Situation", the respondent received a managerial consideration value of one. If the respondent recorded that the decision was based on any one of "Estimation of Costs and Benefits" or "Payback Analysis", the respondent was assigned a managerial consideration score of two. If the respondent recorded any one of "Formal Partial Budget", or "Net Present Value Calculation", a managerial consideration score of three was assigned. The distribution of results is presented in Table 34.

TABLE 34.
TECHNIQUES IN ASSET ACQUISITION: MANAGERIAL CONSIDERATION SCORE

Managerial Consideration Score	Frequency	% of Respondents
1 - Low Managerial Consideration	97	39.3
2 - Medium Managerial Consideration	124	50.2
3 - High Managerial Consideration	26	10.5
Total	247	100

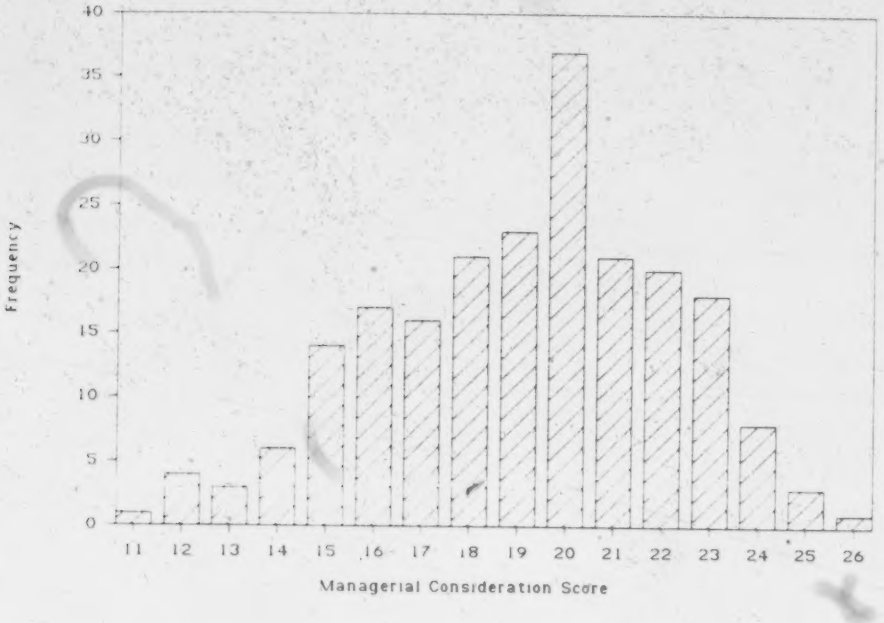
Managerial Consideration Score

The amount of consideration that an individual exhibits in their decision-making behavior has a significant impact on the efficacy of their decisions. Because of the interconnectedness of the farm firm and the farm family, farm household decision makers need to exert a large amount of consideration in their decision-making.

To allow for analysis of the decision-making process of the respondents, a score was derived that consisted of attitudes and behaviors in relation to farm decisions. The component parts of the managerial consideration score are the number and frequency of information contacts, the importance of market conditions, importance of agronomic conditions, frequency of profit calculation, frequency of performing soil tests, record keeping behavior, use of financial records, reasons for decision-making, and techniques of decision-making. The data collected for these components, presented in the preceding sections, were only used for the calculation of the managerial consideration score

The managerial consideration scores ranged from sixteen to thirty, with the mean being 19.5. The standard deviation is 3.015. The distribution of managerial consideration scores is presented in Figure 6. The scores of managerial consideration will be used for further inferential data analysis, presented in Chapter 5.

FIGURE 6. DISTRIBUTION OF MANAGERIAL CONSIDERATION SCORES



Conclusion

The descriptive data analyses presented in Chapter 4 are important to the study in order to provide an understanding of the variety of data collected. Additionally, it is important to derive an understanding of the characteristics of the sample in order to compare the results of this study to census data or other studies. The scores that were computed in Chapter 4: the organizational involvement, risk preference, personal orientation, and managerial consideration scores, will be further analyzed in the inferential analyses presented in Chapter 5.

Endnotes

1. Leanne M. Tigges, and Rachel A. Rosenfeld, "Independent Farming: Correlates and Consequences for Women and Men," *Rural Sociology* 52 (1987).

2. Helen C. Abell, "The 'Womans Touch' in Canadian Farm Work," *Economic Analyst* 24 (1954), p. 37.

3. Don E. Albrecht, and Howard Ladewig, "Adoption of Irrigation Technology: The Effects of Personal, Structural, and Environmental Variables," *Southern Journal of Rural Sociology* 3 (1985).

4. Mohktar M. Abd-Ella, Eric O. Hoiberg, and Richard D. Warren, "Adoption Behavior in Family Farm Systems: An Iowa Study," *Rural Sociology* 46 (1981).

5. Henry F. Noble, *Socio-Economic Problems and Adjustment Needs of the Farm Family in Eastern Ontario*, Research Bulletin, Farm Economics, Cooperatives and Statistics Branch, Ontario Department of Agriculture and Food, 1967.

6. Warren Moran, "The Farm Equity Cycle and Enterprise Choice," *Geographical Analysis* 20 (1988), p. 85.

7. The prevalence of responses rounded to the nearest five or ten based number indicates that the respondents tended to round off or estimate their responses to the question. If the question had been rephrased to as the respondents to state the year of purchase of the farm, more accurate responses may have been achieved.

8. Gordon L. Bultena, and Eric O. Hoiberg, "Factors Affecting Farmers' Adoption of Conservation Tillage," *Journal of Soil and Water Conservation* 38 (1983).

9. David L. Sills, "Voluntary Associations: Sociological Aspects," in *International Encyclopedia of the Social Sciences*, ed. by David L. Sills (U.S.A.: The Macmillan Company and The Free Press, 1968), p. 363.

10. Ibid.

11. Alfred Dean, Herbert A. Aurbach and C.P. Marsh, "Some Factors Related to Rationality in Decision-making Among Farm Operators," *Rural Sociology* 23 (1958), p. 123.

12. Don E. Albrecht and Howard Ladewig, "Adoption of Irrigation Technology: The Effects of Personal, Structural, and Environmental Variables," *Southern Rural Sociology* 3 (1985).

13. Donald J. Blackburn, George L. Brinkman, Herbert C. Driver, and Trevor D. Wilson, *A Comparison of Behavioral and Economic Characteristics of Selected Commercial and Limited Resource Farmers*, School of Agricultural Economics and Extension Education, Ontario Agricultural College, University of Guelph, 1979.

14. W.L. Adamowicz, L. Bauer, J.H. Copeland, and R.J. Haigh, *An Assessment of Current and Potential Use of On-Farm Microcomputers*, Bulletin 7, Department of Rural Economy, University of Alberta, 1984.

15. Jack Harrison, "Computers Not Widely Used by U.S. Farmers," *Farmline*, 10 (1989).

5: INFERENTIAL DATA ANALYSIS

To test the original hypotheses, the descriptive data, presented in Chapter 4, were subjected to an inferential analysis using SPSSx. The initial objectives and hypotheses suggested the following statistical tests: difference of means tests, tests of independence, correlation coefficients and analyses of variance.

Review of The Objectives

The two major objectives of the study were to establish the relationship between personal/farm characteristics of the households and personal orientation and to establish the relationship between personal orientation and the extent to which managerial consideration was exhibited in the decision-making process. The objectives will be achieved by testing the two major hypotheses. The results of the tests are presented in the following sections.

Hypothesis I

The first hypothesis that the personal orientation recorded by farm households will correlate with a specific set of personal characteristics was tested using difference of means tests, tests of independence and analysis of variance, depending upon the type of data. Specifically, those farm households which have both a strong business orientation and a strong social orientation will have the following specific personal characteristics:

a. The farm family will be at an earlier stage of the family life cycle.

b. The farm operators will be younger.

c. The farm operators will have more education.

d. The farm household will have less community organization involvement.

e. The farm household will have more industry organization involvement.

f. The farm operators will have a shorter history of farming.

g. The farm operators will not have inherited their farms.

h. The farm operators will have higher gross sales.

i. The farm operators will have larger farms.

j. The farm operators and/or their spouses will have a large amount of off-farm employment.

k. The farm operators will have a greater tolerance to risk.

For the purposes of analysis, a strong personal orientation score is classified as one which is 15 or greater on the business and social orientation scales, which range from 4 to 20.

Stage of Family Life Cycle

To test the hypothesis that farm operators with high business and social orientations are at an earlier stage of the family life cycle, a test of independence, consisting of a cross-tabulation and chi-square analysis of the data, was performed. The stages of the family life cycle that were used in the analysis were considered in five categories. The first category consists of those respondents where the age of the operator is under 45, and the oldest child, if any are present is under the age of 19. The second category consists of those households where the farm operator is under 45 years, and the oldest child is 19 years of age or over. The third category consists of those households where the farm operator is 45 years or older, and the oldest child is under the age of 19. The final category is comprised of those households where the farm operator is 45 years or older, and the oldest child is in the age category of 19 years or older. The null hypothesis is there is no relationship between personal orientation score and the stage of the family life cycle.

The presentation of the analysis in the contingency table, shown in Table 35, indicates that of those with a personal orientation consisting of both high business and social orientation scores, 37.3 percent are in the first stage of the family life cycle, where the farm operator is young (under 45 years) and the oldest child, if any are present, is 18 years of age and under. Of those a low business score and a high social score, only 14.6 percent are in the first stage of the family life cycle. This appears to provide some support for the initial hypothesis. The chi-square value of 10.82 calculated for the cross-tabulation, however, is not significant at the 0.05 level of probability. As a consequence, the null hypothesis cannot be rejected, and it is concluded that there is no relationship between the stage of family life cycle and personal orientation.

TABLE 35.
STAGE OF FAMILY LIFE CYCLE BY PERSONAL ORIENTATION SCORE*

Personal Orientation Groups	Stage of the Family Life Cycle				
	1	2	3	4	Total
1. Low social and low business score	18 (21.4)	8 (9.5)	25 (29.8)	33 (39.3)	84 (100.0)
2. High social and low business score	6 (14.6)	4 (9.8)	10 (24.4)	21 (51.2)	41 (100.0)
3. Low Social and high business score	10 (18.2)	7 (12.7)	17 (30.9)	21 (38.2)	55 (100.0)
4. High social and high business score	19 (37.3)	6 (11.8)	10 (19.6)	16 (31.4)	51 (100.0)
Total	53 (22.9)	25 (10.8)	62 (26.8)	91 (39.4)	100.0

1 = Young, Children younger than 19
2 = Young, Children 19 years or older
3 = Older, Children younger than 19
4 = Older, Children 19 years or older

* In each cell in this table, the first entry is the number of respondents in that cell, the second is the row percentage.

$\chi^2 = 10.82$
No significant differences found.

Age

The hypothesis that farm households with both a strong business and a strong social orientation will consist of younger decision makers than those households which demonstrate another personal orientation group was tested in a multiple comparison test using one-way analysis of variance. This test was performed for both farm operators and spouses. The null hypothesis is that the population means are equal for the four groups of personal orientation.

As shown in Table 36, the group with the smallest mean age of the farm operator is that which is characterized by having a personal orientation with high scores on both business and social orientations. The mean age of this group is 46.23 which is 7.21 years less than the lowest mean, 53.44 years, which is the mean age of those with a personal orientation characterized by a low business score and a high social score. These initial data appear to provide support for the hypothesis.

TABLE 36.
ONE-WAY ANALYSIS OF VARIANCE OF AGE OF OPERATOR BY PERSONAL ORIENTATION SCORE

Personal Orientation Groups	Mean	N
1. Low social and low business score	51.12	94
2. High social and low business score	53.44	45
3. Low Social and high business score	50.23	61
4. High social and high business score	46.23	53
Total	50.29	253

F = 3.36 p = 0.02

Tukey-b Multiple Comparison Test for Significantly Different Group Means ($p \leq 0.05$):
Group 2 and Group 4[a]

The F value calculated in this test is 3.36, with an observed level of significance of 0.02. The presence of a significant F ratio, which indicates that there is significant variability among the four groups, suggests that the four group means are not equal in the population. A further step, the multiple comparison using a Tukey-b ("honestly significant difference") test. Significantly different group means between groups 2 and 4 were detected. This indicates that the farm operators with a personal orientation which consists of both high social and business scores are significantly younger than those who recorded a high social and a low business score.

The multiple comparison procedure, the results of which are shown in Table 37 was also used to test personal orientation and the age of the spouses. The means calculated for the sample indicate that those in the group with both a high business and a high social score are younger than any of the

a) The Tukey-b, HSD (honestly significant difference), test compares means for pairs of groups. A difference, at a given probability level, is significant if it equals or exceeds the test statistic which is calculated by the following formula:

$$Tukeys'\ B = q_{\alpha}\sqrt{\frac{S_{w}^{2}}{N}}$$

where

S_{w}^{2} = the within-group variance estimate.

N = the number of subjects in each group.

q_{α} = value for given α level with the proscribed degrees of freedom & number of means.

Kirk W. Elifson, Richard P. Runyon, and Audrey Haber, *Fundamentals of Social Statistics* (Ontario: Addison-Wesley Publishing Company, 1982), p. 403.

other groups. The largest difference is 4.03 years between groups 4 and 2. The F value for this analysis, 1.14, was not significant at the 0.05 level, therefore, the null hypothesis that there is no difference between the group means cannot be rejected.

TABLE 37.
ONE-WAY ANALYSIS OF VARIANCE OF AGE OF SPOUSE BY PERSONAL ORIENTATION SCORE

Personal Orientation Groups	Mean	N
1. Low social and low business score	48.00	78
2. High social and low business score	48.05	40
3. Low Social and high business score	46.94	47
4. High social and high business score	44.02	44
Total	46.93	209

F = 1.14 p = 0.24

Tukey-b Multiple Comparison Test: No Significant Differences

While the means from the sample tend to support the initial hypothesis, that those respondents with a high business score will be younger than all other respondents, the hypothesis was not entirely proven. The multiple comparison tests determined that if only farm operators are considered, there is significant evidence that those with a high business score and a high social score are younger than those with a high social and low business score. When only the spouses are considered, there is no significant difference between any of the personal orientation groups.

Education

The hypothesis that those respondents from households which recorded both high business and social orientation scores will have more education than those from other households was tested by constructing a contingency table and performing a chi-square test of independence. The null hypothesis in this analysis is that the two variables are independent of each other. Since the majority of respondents indicated that both the husband and wife are considered to be the farm operators, the cross-tabulations and the associated statistical analyses were performed for both the farm operators and their spouses.

TABLE 38.
EDUCATION OF FARM OPERATOR BY PERSONAL ORIENTATION SCORE*

Personal Orientation Groups	Level of Education				
	Less Than High School	Some High School	High School Complete	Some Post Secondary	Total
1. Low social and low business score	27 (28.4)	20 (21.1)	15 (15.8)	33 (34.7)	95 (100.0)
2. High social and low business score	20 (45.5)	8 (18.2)	8 (18.2)	8 (18.2)	44 (100.0)
3. Low Social and high business score	16 (26.2)	14 (23.0)	8 (13.1)	23 (37.7)	61 (100.0)
4. High social and high business score	14 (25.9)	15 (27.8)	11 (20.4)	14 (25.9)	54 (100.0)
Total	77 (30.3)	57 (22.4)	42 (16.5)	78 (30.7)	254 (100.0)

* In each cell in this table, the first entry is the number of respondents in that cell, the second is the row percentage.

$\chi^2 = 10.39$
No significant differences found.

Examination of the contingency table of the level of education and personal orientation, Table 38, appears to provide support for the hypothesis. Of the respondents who had a personal orientation characterized by a high business and a low social score, 37.7 percent had some post secondary education, and 26.2 percent did not receive any high school education. Of those respondents who recorded a low business orientation and a high social orientation, only 18.2 percent attended some post secondary institution, while 45.5 percent did not attend school past grade 9. The apparent relationship is not, however, supported by a significant chi-square statistic. The null hypothesis cannot be rejected that there is no relationship between farm operators' level of education and personal orientation score.

The relationship between the level of education of the spouse and personal orientation score is examined in Table 39. No apparent relationship is observed in the contingency table. This lack of a relationship is supported by the presence of an insignificant chi-square statistic. The null hypothesis must be rejected, and it is concluded that there is no relationship between spouses' education and personal orientation score.

TABLE 39.
EDUCATION OF SPOUSE BY PERSONAL ORIENTATION SCORE*

Personal Orientation Groups	Level of Education				
	Less Than High School	Some High School	High School Complete	Some Post Secondary	Total
1. Low social and low business score	11 (13.9)	18 (22.8)	23 (29.1)	27 (34.2)	79 (100.0)
2. High social and low business score	7 (17.9)	12 (30.8)	13 (33.3)	7 (17.9)	39 (100.0)
3. Low Social and high business score	7 (15.9)	10 (22.7)	10 (22.7)	17 (38.6)	44 (100.0)
4. High social and high business score	7 (15.9)	8 (18.2)	20 (45.5)	9 (20.5)	44 (100.0)
Total	32 (15.5)	48 (23.3)	66 (32.0)	60 (29.1)	206 (100.0)

* In each cell in this table, the first entry is the number of respondents in that cell, the second is the row percentage.

$\chi^2 = 10.49$
No significant differences found.

The initial hypothesis, that farm operators from households with high business and social orientation scores will have more education, must be rejected. Any observed relationship between education and personal orientation in the sample cannot be generalized to the larger population.

Community Organization Involvement

A one-way analysis of variance was performed to test the hypothesis that those households which record high business and social orientation scores will have less community organization involvement than other respondents. The null hypothesis is that there is no difference in the mean scores for the four personal orientation groups.

The groups with the highest level of community organization are group 2, which corresponds to a personal orientations characterized by a high social and a low business orientation, and group 4, which corresponds to a high social and a high business orientation. Both of these groups have in common a high social orientation score which may suggest some relationship between social orientation and community organization involvement. Those respondents to whom social goals are very important are more likely to have involvement in social organizations.

TABLE 40.
ONE-WAY ANALYSIS OF VARIANCE OF COMMUNITY ORGANIZATIONAL INVOLVEMENT SCORE BY PERSONAL ORIENTATION SCORE

Personal Orientation Groups	Mean	N
1. Low social and low business score	1.97	95
2. High social and low business score	3.16	45
3. Low Social and high business score	2.52	62
4. High social and high business score	2.93	55
Total	2.51	257

$F = 2.56$ $p = 0.06$

Tukey-b Multiple Comparison Test: No Significant Differences

The F ratio for this analysis is 2.56, and is not significant at the 0.05 level. This indicates that there is very little variance between the four groups. Any observed relationship is likely due to random sample variations and cannot be generalized to the larger population. Thus, the null hypothesis cannot be rejected, and it is concluded that there is no difference in the mean community organization score between the four groups of personal orientation. The initial hypothesis that those with a high business orientation will have a lower level of community involvement is not proven.

Industry Organization Involvement

The hypothesis that farm households with high levels of business and social orientations will have more participation in industry organizations was tested by a one-way analysis of variance. The null hypothesis is that there is no difference in the industry organization involvement score among the four personal orientation groups.

The distribution of means, presented in Table 41, indicates that the group with the highest involvement in industry organizations is the group that is characterized by both a high business and a high social orientation score. The significant F value, of 3.34 indicates that there is variance among the four groups. This provides evidence that some of the means for the four groups are significantly different. Further analysis of the means is suggested by the F value. The Tukey-b test indicates that group 1, low business and low social orientation, and group 4, high business and high social orientation, are significantly different from each other. Since none of the other groups are significantly different,

TABLE 41.
ONE-WAY ANALYSIS OF VARIANCE OF INDUSTRY ORGANIZATION INVOLVEMENT SCORE BY PERSONAL ORIENTATION SCORE

Personal Orientation Groups	Mean	N
1. Low social and low business score	1.39	95
2. High social and low business score	1.60	45
3. Low Social and high business score	1.77	62
4. High social and high business score	2.36	55
Total	1.73	257

$F = 3.34$ $p = 0.02$

Tukey-b Multiple Comparison Test for Significantly Different Group Means ($p \leq 0.05$): Group 4 and Group 1

this indicates that those farm operators who have a personal orientation strong in both business ***and*** social orientations have more industry organization involvement than those with both low business and social orientation scores.

History Of Farming

The hypothesis that farm operators in households with high business and social orientation scores will have a shorter history of farming, two different tests were performed. History of farming is composed of two variables. The first variable is the number of years that the farm operator(s) have been operating on their current farm. The second variable is the number of years that the current farm has been farmed by the operator(s) and their predecessors, if any.

Length of Time on Current Farm by Operator

A one-way analysis of variance was performed to determine if the mean number of years that the operator has been on his/her current farm is related to personal orientation. The data, presented in Table 42, indicate that the group with the least number of years of operation of the farm is group 1, characterized by a personal orientation with both low social and business orientations. The group that have been working on the current farm for the longest period of time is group 2, which consists of those respondents with high social and low business orientation. This group has been farming for a mean of 31.6 years, which is 8.1 years greater than the group with the next highest number of years of farming.

TABLE 42.
ONE-WAY ANALYSIS OF VARIANCE OF YEARS OF OPERATOR WORKING ON CURRENT FARM BY PERSONAL ORIENTATION SCORE

Personal Orientation Groups	Mean	N
1. Low social and low business score	22.09	95
2. High social and low business score	31.62	45
3. Low Social and high business score	23.16	62
4. High social and high business score	23.51	53
Total	24.33	255

$F = 5.24$ $p = 0.002$

Tukey-b Multiple Comparison Test for Significantly Different Group Means ($p \leq 0.05$): Group 2 and Group 1, Group 2 and Group 3, Group 2 and Group 4

The F value of 5.24 is highly significant, which suggests that all of the groups means are not equal. The results from the Tukey-b test indicate significant differences between groups 2 and 1, groups 2 and 3, and groups 2 and 4. Those with a high social and a low business orientation tend to have been working on the current farm for a longer period of time than any other personal orientation group. The null hypothesis that there is no difference in the means of the four groups must be rejected. However, the initial hypothesis that those with high business and social orientations will have been operating on their current farms for a shorter period of time, cannot be proven conclusively.

Length of Time Farm Has Been Owned By Family

To further test the hypothesis that those with high business and social orientation scores will have a shorter history of farming, a one-way analysis of variance, between orientation and the length of time that the farm has been owned by the family, was performed. The data presented in Table 43 indicate that the group with the greatest number of years of family ownership of the farm is group 2, those with a high social and a low business orientation score. Group 2 has a mean number of years of family ownership of 50.3, which is 14.8 years more than Group 1, which has a mean of 35.5 years of family ownership. These results appear similar to the preceding analysis between orientation and the length of time on current farm.

TABLE 43.
ONE-WAY ANALYSIS OF VARIANCE OF LENGTH OF FAMILY OWNERSHIP OF FARM BY PERSONAL ORIENTATION SCORE

Personal Orientation Groups	Mean	N
1. Low social and low business score	35.52	92
2. High social and low business score	50.30	43
3. Low Social and high business score	36.22	59
4. High social and high business score	41.48	50
Total	39.52	244

$F = 4.06$ $p = 0.008$

Tukey-b Multiple Comparison Test for Significantly Different Group Means ($p \leq 0.05$): Group 2 and Group 1, Group 2 and Group 3

The F ratio of 4.06 is highly significant, and is evidence that some of the means are significantly different from each other. The Tukey-b test indicates that groups 2 and 1 and groups 2 and 3 are statistically different from each other at the 0.05 level of significance. Those with high social and low business orientation scores tend to live on a farm that has been owned by their family for a longer period of time than those with a personal orientation characterized by both low business and social scores and those with a high business and a low social score.

The two components of the length of time that the farm operator has been farming the current farm and the length of time that the farm has been in the family appear to be related to a high level of social orientation. Those with a high social orientation score tend to have a longer history of farming. A possible explanation for this is that those with a longer history of farming feel more secure about the survival of their farming operation. Since the farm has existed for a long period of time, it is unlikely to be dependent on outside financing and as financially unstable as a farm that has been recently established. The farmers with the longer history of farming are no longer as concerned with business goals as they are with social goals.

Farm Transfer

A chi-square test of independence was performed to test the hypothesis that the farm operators in households which have high business and social orientations will not have inherited their farms. The null hypothesis is that the variables of inheritance and business orientation score are independent.

The cross-tabulation, shown in Table 44, presents some evidence of a relationship between inheritance and personal orientation. More respondents with both high social and business orientation scores (61.2%) and those with high social and low business orientation scores (58.1%) inherited their farms than those with high social and low business orientation scores (45.8%) or those with both low social and business orientation scores (45.7%). The chi-square value of 4.63 is not significant at the 0.05 level, therefore, the null hypothesis cannot be rejected. No statistically significant relationship between farm transfer and personal orientation can be detected.

TABLE 44.
FARM TRANSFER BY PERSONAL ORIENTATION SCORE*

Personal Orientation Groups	Farm Transfer		
	Did Not Inherit Farm	Inherited Farm	Total
1. Low social and low business score	50 (54.3)	42 (45.7)	92 (100.0)
2. High social and low business score	18 (41.9)	25 (58.1)	43 (100.0)
3. Low Social and high business score	32 (54.2)	27 (45.8)	59 (100.0)
4. High social and high business score	19 (38.8)	30 (61.2)	49 (100.0)
Total	119 (49.0)	124 (51.0)	243 (100.0)

* In each cell in this table, the first entry is the number of respondents in that cell, the second is the row percentage.

$\chi^2 = 4.63$
No significant differences found.

Gross Sales

A test of independence of means, using a chi-square test statistic, was performed to test the hypothesis that those with high business and social orientations will have higher incomes. The amount of gross sales earned in a one year period was used as an approximation of farm income, as it is an easily collectible datum using a questionnaire format. The null hypothesis in this test is that there is no relationship between gross sales and personal orientation.

As shown in Table 45, there is a positive relationship between gross sales and personal orientation. Of those with both low social and business orientations, 57 percent earned less than 25,000 dollars in gross sales and only 9.7 percent earned more than 100,000 dollars in gross sales. Whereas, those with both high social and business orientations only 28.3 percent earned less than 25,000 dollars and 22.6 percent earned more than 100,000 dollars in gross sales. The value of gamma is 0.27 which supports the appearance of a positive relationship between the two variables. The chi-square statistic of 22.7 is significant at the 0.01 level, therefore, the null hypothesis can be rejected. It must be concluded that there is a relationship between gross sales and personal orientation. Those farm operators who exhibited a high level of both business and social orientations tended to earn more in gross sales than those with low scores in both orientations.

TABLE 45.
GROSS SALES BY PERSONAL ORIENTATION SCORE*

Personal Orientation Groups	Level of Gross Sales				
	Less Than $25,000	$25,000-49,999	$50,000-99,999	$100,000 and over	Total
1. Low social and low business score	53 (57.0)	17 (18.3)	14 (15.1)	9 (9.7)	93 (100.0)
2. High social and low business score	16 (39.0)	5 (12.2)	7 (17.1)	13 (31.7)	41 (100.0)
3. Low Social and high business score	18 (30.0)	14 (28.3)	14 (23.3)	14 (23.3)	60 (100.0)
4. High social and high business score	15 (28.3)	14 (26.4)	14 (26.4)	12 (22.6)	53 (100.0)
Total	102 (41.3)	50 (20.2)	47 (19.0)	48 (19.4)	(100.0)

* In each cell in this table, the first entry is the number of respondents in that cell, the second is the row percentage.

$X^2 = 22.67$
9 Degrees of Freedom
Significance = 0.01
Gamma = 0.27

Farm Size

It was hypothesized that those with high business and social orientation scores will have larger farms. To test this hypothesis, a one-way analysis of variance, presented in Table 46, was performed. The null hypothesis in this analysis is that there will be no difference in the mean farm size for the four categories of personal orientation.

The results of the analysis indicate that those with both high social and business orientation scores have the largest number of acres, with a mean of 662.75. Those with high social and low business scores and those with high business and low social scores have slightly smaller farm sizes. Those with both low social and business orientation scores have the smallest farm size, with a mean of 472.94 acres. The F statistic of 1.93 is not significant at the 0.05 level. This is an indication that there is little chance that the population means are unequal for the four groups. The insignificant value of F is reinforced by the Tukey-b multiple comparison test, which failed to find any significant differences between any of the means. The null hypothesis is accepted, and it is concluded that there is no statistically significant difference in farm size for the four categories of personal orientation.

TABLE 46.
ONE-WAY ANALYSIS OF VARIANCE OF FARM SIZE BY PERSONAL ORIENTATION SCORE

Personal Orientation Groups	Mean	N
1. Low social and low business score	472.94	94
2. High social and low business score	632.75	44
3. Low Social and high business score	642.69	61
4. High social and high business score	662.75	55
Total	582.49	254

$F = 1.93$ $p = 0.13$

Tukey-b Multiple Comparison Test: No Significant Differences

Off-Farm Employment

To test the hypothesis that operators and spouses in households with a high levels of business and social orientations will perform more off-farm work, a chi-square test of independence was

performed. A separate analysis was performed for both farm operators and spouses. The null hypothesis is that there is no relationship between amount of off-farm employment and personal orientation.

The results of the first cross-tabulation, presented in Table 47, indicate that the category with the highest frequency of working from 7 months to all year, is the personal orientation where both social and business orientation scores are high (46.7%). Respondents with the personal orientation category of high social and low business orientation scores had the highest frequency of working less than one week per year (54.7%). The presence of a weak gamma value of 0.13, indicates the presence of a slightly positive relationship. The chi-square value of 5.29 is, however, not significant at the 0.05 level, consequently, the apparent relationship is not statistically significant. Any observed relationship is due to random sample fluctuations.

TABLE 47.
OFF-FARM WORK PERFORMED BY FARM OPERATOR BY PERSONAL ORIENTATION SCORE*

Personal Orientation Groups	Amount of Off-Farm Work Per Year			
	Less Than One Week	2 Weeks - 6 Months	7 Months - All Year	Total
1. Low social and low business score	45 (52.9)	13 (15.3)	27 (31.8)	85 (100.0)
2. High social and low business score	22 (53.7)	7 (17.1)	12 (29.3)	41 (100.0)
3. Low Social and high business score	29 (54.7)	8 (15.1)	16 (30.2)	53 (100.0)
4. High social and high business score	16 (35.6)	8 (17.8)	21 (46.7)	45 (100.0)
Total	112 (50.0)	36 (16.1)	76 (33.9)	224 (100.0)

* In each cell in this table, the first entry is the number of respondents in that cell, the second is the row percentage.

$\chi^2 = 5.29$
No Significant Differences.

The cross-tabulation of the amount of off-farm work performed by spouses and personal orientation is presented in Table 48. There appears to be little relationship between the two variables. This observation is supported by a very small gamma value of 0.008. The chi-square value is not

TABLE 48.
OFF-FARM WORK PERFORMED BY SPOUSE BY PERSONAL ORIENTATION SCORE*

Personal Orientation Groups	Amount of Off-Farm Work Per Year			
	Less Than One Week	2 Weeks - 6 Months	7 Months - 11 Months	Total
1. Low social and low business score	33 (46.5)	13 (18.3)	25 (38.2)	71 (100.0)
2. High social and low business score	20 (55.6)	6 (16.7)	10 (27.8)	36 (100.0)
3. Low Social and high business score	18 (40.9)	12 (27.3)	14 (31.8)	44 (100.0)
4. High social and high business score	14 (40.0)	12 (34.3)	9 (25.7)	35 (100.0)
Total	85 (45.7)	43 (23.1)	58 (31.2)	186 (100.0)

* In each cell in this table, the first entry is the number of respondents in that cell, the second is the row percentage.

$\chi^2 = 5.66$
No Significant Differences.

significant at the 0.05 level, therefore the null hypothesis that there is no relationship between the two variables cannot be rejected. The initial hypothesis that those spouses from households with high business and social orientations will perform more off-farm work than those in other households, cannot be proved.

Percent of Income from Off-Farm Employment

To further test the hypothesis that those with high business and social orientations will have more off-farm employment, a one-way analysis of variance, presented in Table 49, was performed. The null hypothesis in this analysis is that there is no difference in the means for each of the personal orientation categories.

The means calculated for each personal orientation category indicate that those with both high social and business orientations derive the largest percentage of their total income from off-farm employment, with a mean of 38.06 percent. Those with the smallest percentage of their total income derived from off-farm employment are those with both low social and business orientations, with a mean of 24.74 percent.

The F value calculated in this analysis is 2.15, and is not significant at the 0.05 level. The null hypothesis, that there is no difference in the means calculated for each of the categories of personal orientation cannot be rejected. It must be concluded that there is no difference in the percentage amount of total income that is derived from off-farm employment for the categories of personal orientation. The initial hypothesis that those with a high business orientation score will have more off-farm employment cannot be supported.

TABLE 49.
ONE-WAY ANALYSIS OF VARIANCE OF PERCENT OF FAMILY INCOME DERIVED FROM OFF-FARM EMPLOYMENT BY PERSONAL ORIENTATION SCORE

Personal Orientation Groups	Mean	N
1. Low social and low business score	24.74	83
2. High social and low business score	31.00	42
3. Low Social and high business score	36.94	50
4. High social and high business score	38.06	52
Total	31.63	227

F = 2.15 p = 0.10

Tukey-b Multiple Comparison Test: No Significant Differences

Risk Preference

The hypothesis that those with high business and social orientations will have a greater preference for risk was tested by performing a one-way analysis of variance. The results, presented in Table 50, indicate that the personal orientation category with the highest level of risk preference is comprised of those households which scored a high business and low social orientation score. The group with the next highest level of risk preference is those respondents with both high social and business orientation scores. The mean risk preference scores are all close in value for each of the personal orientation categories. The F value is, consequently, not significant at the 0.05 level. The null hypothesis cannot be rejected, and it is concluded that there is no difference in the risk scores for each of the categories of personal orientation. The initial hypothesis is disproved, those with high business orientation scores do not have higher risk preference scores than those with high social orientation scores.

TABLE 50.
ONE-WAY ANALYSIS OF VARIANCE OF RISK SCORE BY PERSONAL ORIENTATION SCORE

Personal Orientation Groups	Mean	N
1. Low social and low business score	12.21	95
2. High social and low business score	12.49	45
3. Low Social and high business score	13.16	62
4. High social and high business score	12.55	55
Total	12.56	257

$F = 0.75$ $p = 0.52$

Tukey-b Multiple Comparison Test: No Significant Differences

Hypothesis II.

The second hypothesis in the study is that farm operators from households which have strong business and social orientations will rank higher on the scale of managerial considerations in the decision-making process than those farmers who have a strong social orientation. The null hypothesis is that there is no difference in the managerial consideration score for the four personal orientation categories.

The results from the one-way analysis of variance that was used to test the relationship are presented in Table 51. The category with the highest managerial consideration score is the personal orientation combination of high business and high social orientations with a mean managerial consideration score of 21.1. The group with the lowest mean managerial score is the personal orientation of both low social and business scores, with a managerial consideration score of 19.1. The F value of 7.93 is highly significant, so it can be concluded that the means are not equal. The Tukey-b multiple comparison procedure indicated each of groups 4, 3 and 2 are significantly different from Group 1. Those farm operators who scored high on both the business and social orientation scales tended to have a higher managerial consideration score than those with both low business and social orientations. No significant differences were detected between groups 4, 3 and 2. However, this does provide support for the initial hypothesis that those with high business and social orientations will have higher managerial consideration scores than other personal orientation group.

TABLE 51.
ONE-WAY ANALYSIS OF VARIANCE OF MANAGERIAL CONSIDERATION BY PERSONAL ORIENTATION SCORE

Personal Orientation Groups	Mean	N
1. Low social and low business score	19.10	78
2. High social and low business score	20.53	34
3. Low Social and high business score	20.90	49
4. High social and high business score	21.11	44
Total	20.20	205

$F = 7.93$ $p = 0.0001$

Tukey-b Multiple Comparison Test for Significantly Different Group Means ($p \leq 0.05$): Group 4 and Group 1, Group 3 and Group 1, Group 2 and Group 1

Other Findings

An initial assumption of this study was that the two personal orientations being studied, business and social, were somehow in opposition. A farm operator was considered to have either a business or a social orientation. As the study developed, it became apparent that these orientations are not in opposition, but rather are complementary parts of the larger value orientation of the individual. Additional study of the relationship between social orientation and the personal and farm firm characteristics was suggested by the amount of correlation between business and social orientation discovered in the process of analyzing the data. The presence of correlation between the two orientations is indicated in the zero order correlation coefficient of 0.25 (significant at the 0.01 level), shown in Appendix F. The assumption that business and social orientation are opposing characteristics was proven to be incorrect. The measure of personal orientation that was eventually incorporated into the hypotheses and the preceding data analysis allowed the possibility that farm operators could score high or low in both business and social orientation scales at the same time.

Some of the early research based on the assumption that business and social orientations are in opposition yielded data that are presented in Table 52. To test the hypothesis that farm households with a strong business orientation will consist of younger decision makers that those households which do not demonstrate a strong business orientation, a t-test was performed. The test was performed for

both farm operators and spouses. The null hypothesis is that the population means are equal for those with a high or a low business orientation. The results from the t-tests, shown in Table 52 indicate significant differences for both the age of spouse and operator between those with a high business and those with a low business orientation score. Significant differences, were not, however, found in the ages of spouses or operators between those with a low social and those with a high social orientation score.

The test of the relationship between community organization involvement and personal orientation score yielded significant differences for those with high and low social orientation scores. The mean community organization score for those with a high social orientation score was 3.00 and 2.15 for those with a low community organization score. No significant differences were found between high and low business orientation scores.

The industry organization involvement score for those with a high business orientation (2.05) was significantly higher than the score for those with a low business orientation score (1.46). There was no significant difference detected between those with high and low social orientation scores.

The results of the t-test for the length of time that the farm operators have been working on the current farm, shown in table 52, indicate that those with a high social orientation score have been farming on the current farm for a significantly longer period (27.3 years) than those with a low social orientation score (22.7 years). There was no statistically significant difference found for high and low business orientation scores.

The results from the t-test for the length of time that the farm has been owned by the operator and predecessors are shown in Table 52. The results indicate that a significant difference in the number of years that the farm has been in the family was found between those with a high social orientation score and those with a low social orientation score. This provides clarification of the multiple comparison test performed for these variables. Group 2 which is comprised of those respondents who exhibited a high social and a low business orientation was found to live on a farm that has been in the family for a longer period of time than the two other orientation groups characterized by low social orientations.

The t-test that was performed for farm size on both high and low business orientations and high and low social orientations found a statistically significant difference between those with high business orientations and those with low business orientations. Those with a high business orientation had an average of 652.2 acres and those with a low business orientation had an average of 522.14 acres. The

fact that a significant result was found in the t-test and not in the multiple comparison test indicates that when business and social orientations are combined into the personal orientation variable with four possible values, there are interaction effects between the variables.

As shown in table 52, the test of the relationship between the percent of income that is derived from off-farm employment indicated that those with a high business orientation had significantly more income derived from off-farm employment than those with low business orientation score. No significant difference between high and low social orientations was detected. No significant differences were found among the personal orientation scores for risk score.

A t-test was performed to determine any relationship between personal orientation and managerial consideration score. The mean managerial consideration scores calculated for the two types of personal orientation indicate that there is only a minimal difference in the managerial consideration score between those with a high business orientation and those with a high social orientation score. However, for both personal orientation types, those with a high level of orientation have a higher managerial orientation score than those with a low level of that orientation. As shown in Table 52, there are statistically significant differences in mean managerial consideration scores between high and low scoring respondents in both of the personal orientation categories.

Summary

When the relationship of business and social orientation scores and the other variables were studied there were a number of significant relationships found (presented in Table 52). However, further analysis indicated that there were fewer differences between business and social orientation than there were similarities. Thus, a score for personal orientation which allows for a number of combinations of business and social scores was derived.

It was determined from the analysis that farm operators with clearly defined value orientations, regardless of whether the orientation is of a business or a social nature, tend to exhibit a number of the personal and farm characteristics delineated in hypothesis 1. In addition, these farm operators demonstrate more consideration in their managerial decision-making process.

TABLE 52.

INDEPENDENT VARIABLES WITH HIGH AND LOW BUSINESS AND SOCIAL ORIENTATION SCORES

Variable	Personal Orientation Score					
	High Business	Low Business	t-value	High Social	Low Social	t-value
Age of Operator	48.37 (114)	51.94 (140)	1.10**	49.74 (99)	50.97 (160)	-0.76
Age Of Spouse	45.53 (91)	48.06 (119)	-1.66*	46.12 (85)	47.68 (130)	-1.00
Community Org. Involve.	2.71 (117)	2.35 (141)	1.06	3.00 (101)	2.15 (162)	2.4*
Industry Org. Involve.	2.05 (117)	1.46 (141)	2.48**	2.01 (101)	1.54 (162)	1.9
Years of Operation	23.32 (115)	25.23 (141)	-1.07	27.33 (99)	22.72 (162)	2.56**
Years of Family Ownership	38.63 (109)	40.33 (136)	-0.53	45.41 (94)	35.42 (156)	3.14**
Total Acres Farmed	652.20 (116)	522.14 (139)	1.85*	651.52 (100)	527.30 (160)	1.75
Percent Inc. From Off-Farm	37.51 (102)	26.63 (126)	2.40**	34.54 (95)	28.95 (138)	1.22
Risk Score	12.87 (117)	12.27 (141)	1.24	12.42 (101)	12.38 (160)	0.07
Managerial Consideration Score	21.00 (93)	19.54 (112)	3.99**	20.85 (79)	19.77 (128)	2.83**

**Significant at the 0.01 level
*Significant at the 0.05 level

6: SUMMARY

The initial question which motivated this study was "Why do farmers make some decisions which seemingly cannot be explained by economic analyses?"

> When people choose to remain in farming, despite lower incomes in many cases and less ready access to medical, religious, social and recreational facilities, it must be because they value certain satisfactions derived from farming over those that could be derived from a higher paying non-farm job.[1]

The main argument of this study has been that farmers make decisions other than would be expected because they have different value orientations. It is their value orientations which lead them to view situations and alternatives from a different perspective than any other farm operators. These same value orientations are those which motivate the farm operator to take on the occupation of farming in the first place despite the alternatives available.

Conclusions

The following conclusions were reached as a result of the data analysis presented in Chapters 4 and 5.

1) Farm operators with a personal orientation which consists of high social and high business scores are significantly younger than those with a high social and a low business score. Younger farm operators have more opportunities available than older operators to change careers if they are not satisfied with farming as a career. Those younger farm operators who do not place a high value on the elements of farming are likely to quit and take on an alternative career. It is possible, therefore, that the younger farm operators in the sample are farming out of choice. An older farm operator who does not value the business or social aspects of farming, is less likely to have as many employment opportunities or education skills, because of age, as the younger farmer. This farm operator is more likely to stay with farming, because there are not as many alternatives readily available.

2) Those farm operators who have a personal orientation which is strong in both business and social orientations have more industry organizational involvement than those with both low business and social orientation scores. A plausible explanation for this is that those operators who place a high level of value on the business and social aspects of farming are likely to be involved in industry related

organizations which may provide useful farming information. This farm related information will assist the decision maker in making more informed decisions by reducing some uncertainty and, ultimately, work toward the survival of the farm.

3) Farm operators who exhibited a combination of high social and low business orientations tended to have been both working on their current farm and living on a farm that has been owned by the family for a longer period of time that any other personal orientation combination. This finding is supported by a difference of means test which considered the history of farming for those with high social and low social orientations.

Those farm households whose operators have a longer history of farming tend to have a high social orientation score. A possible explanation for these findings is that operators on farms that have existed for longer periods have already survived the critical period that can occur when a farm is newly established and is not yet in a situation of financial stability. The farmers with the longer history of farming are no longer as concerned with business goals as they are with social goals. They are more likely to have already achieved the financial goals that are central to a farm operator just establishing an operation. Since the financial goals have already been reached, the farm operators have more resources available to spend working toward satisfying family and societal goals.

4) There is a relationship between level of gross sales and personal orientation. Those farm operators who exhibited high levels of both business and social orientations tended to earn more in gross sales than those with low scores in both orientations. A likely explanation for this result is that since operators with both high business and high social orientations highly value both the business and the social concerns of their farm household, they are more likely to act to insure the longevity of their farms. If there is more concern with the longevity of the farm, there will be more emphasis placed on achieving higher levels of gross sales in order to assure survival.

5) The difference of means test between high and low business orientations determined that those with a high business orientation had significantly larger farms than those with low business orientation. Farm operators to whom the goal of enterprise expansion is important would likely score higher on the business orientation scale. These operators are likely to value business goals and, as a consequence, make decisions that lead to the establishment of larger farms.

6) Those farm operators who scored high on both the business and social orientation scales tended to have a higher managerial consideration score. The group with the lowest managerial consideration score is the group who had the personal orientation combination of both low social and business scores.

Additional support was provided by the difference of means tests between high and low business orientations and high and low social orientations. For both orientations there are statistically significant differences in the mean managerial consideration scores. Those with a high level of either business or social orientation have a higher managerial orientation score than those with a low level of that orientation. This is an indication that the social and business goal statements in the study may not have been discrete. They may have been measuring a similar trait.

A possible explanation for these findings is that those farm operators who place emphasis on both economic and social goals are interested in a broad range of the benefits from farming. They place high value on both the financial and social/psychological aspects of farming. Thus they will exhibit more consideration in their managerial decision-making process in order to ensure the longevity of their farm. This behavior will work to ensure the further achievement of more of the goals in farming that they feel are important.

Discussion

Frequently, in decision-making research which seeks to establish the presence of goals other than profit maximization, there is reference to two types of goals, economic and non-economic goals.[a] Goals that are viewed to be economic are goals such as profit maximization, having a farm business that provides a wage similar to that in any other business, and establishing a growing farm business. Family involvement in the farm, community recognition, and a healthy lifestyle are goals that are viewed as being non-economic. Petrini comments on the assumptions inherent in the dichotomy of economic and non-economic goals.

> There is a tendency among economists as well as sociologists to talk about so-called non-economic goals in contrast to the economic ones. First of all it should be observed that many of the non-economic goals can be redefined in economic terms and then there is only a matter of definition. Second, there are more reasons for believing that the so-called non-economic goals are operating as complementary goals and not competing with the economic ones, than to the contrary.

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a) See for example: Donald J. Blackburn, George L. Brinkman, Herbert C. Driver, and Trevor D. Wilson, *A Comparison of Behavioural and Economic Characteristics of Selected Commercial and Limited Resource Farmers*, Research Report, School of Agricultural Economics and Extension Education, Ontario Agricultural College, University of Guelph, 1979.

The data analysis for the study provided support for the assertion that economic and non-economic, as they are frequently referred to, should not be viewed as competing goals.[3] Respondents with high managerial consideration scores tended to have high scores, in this study, on ***both*** social and business orientation scales.

An explanation for the apparent positive relationship between business and social orientations is that, although they may appear to be outwardly incongruous terms, they are measuring related elements of a broader concept, value orientations. The concept of value orientations is not a specific one. It does more than simply provide a guide for the decisions of an individual when a problem is encountered. Rather, a value orientation is something which frames how the individual perceives the world and his/her place in it. The orientation is neither specifically economic or non-economic, social or business. A value orientation is a synthesis of all of these factors plus other social, psychological and economic values and ideas. The varying proportions of each of these elements is what makes the individual unique.

The results from the study indicate that if an individual exhibits a strong agreement with goal statements which are indicative of both social and business orientations, that individual will also exhibit a greater amount of consideration of managerial processes when making decisions. These farmers are interested in a broad range of the benefits from farming. They place high value on both the financial and social/psychological aspects of farming. Thus they will exert more consideration in their managerial decision-making process in order to ensure the longevity of their farm. This behavior will work to ensure the further achievement of more of the goals in farming that they feel are important.

Strange provides further evidence for the complementarity of social and business goals when he criticizes researchers who only consider the goal of profit maximization in their analyses of farm decision-making.

> They discount the influence of other values - community, loyalty, love of the land, and continuity... But these values are real, and they are economic values because they influence economic behavior. Sometimes, when it counts the most, they are the values that can be measured most readily.[4]

When considering the farm decision-making process, it is imperative to consider ***all*** of the goals and values that act as motivating factors. These factors are important more than just as motivating factors, but because they are so central to the individual, they play a role throughout the decision process. When considering the constraints that influence the decision maker throughout the decision process, the social, psychological and economic goals and values should not be overlooked.

Despite the fact that many of the influential goals and values have social or psychological origins, when they are considered in relation to the decision-making process, it is important to recognize that they are economic values. They are economic because of their influence on a very economic behavior, the process of making farm decisions.

Recommendations

Any study which aims to measure a continually evolving, dynamic process, such as decision-making behavior is limited by the difficulty in quantifying a process. The current study attempted to measure as much of the decision-making process as possible by examining activities that occurred at various stages of the process. Behaviors related to information gathering, and processing, were measured and analyzed. A study of this nature, which examines stages during the decision process, is limited however, in the explanatory power in relation to the process as an entirety.

Future studies of the decision-making process would benefit from a combination of a detailed quantitative and a qualitative analysis of the process of making decisions. To effectively study the decision-making process of farm families a longitudinal study over a period of a number of years would be advantageous. Study over a number of years would be beneficial to evaluate the decision process of a household as it evolves and changes as the structure of the family changes. The tool of measurement amenable to study of a process is a qualitative analysis, in the form of in-depth interviews. Such an analysis would complement quantitative analyses, by providing more detailed study of factors in the decision process which are not always amenable to quantification. The quantitative analysis would bolster data gathered from the interview by studying the ability to generalize the findings from the interview process to the general population.

A possible explanation for the small number of significant relationships found between personal orientation and the personal and farm characteristics of respondents is the measure of personal orientation that was used. The study only used eight statements to measure business and social orientation. It is possible that a stronger and more differentiated measure of personal orientation would have been attained by using a large number of goal statements to measure each of the orientations. A recommendation for future studies is that a larger series of goal statements be used to elicit business and social orientations.

It is important for future farm decision-making studies to view management decision-making not purely as an economic activity, but rather, as a social ***behavior*** related to the occupation of farming in the environment of the individual, the family, and the community.[5] The constraints caused by the relative importance of each of these elements, and their interaction with the value orientation of the decision maker(s) are key factors influencing decision processes. It is because of the value orientation of the individual that people perceive the world differently and, within a specific occupation such as farming, make decisions differently.

Concluding Statement

A frequent assumption made in many studies about business decision-making is that 'economic' and 'noneconomic' values are somehow in opposition. During this study, it became apparent that these orientations are not in opposition, but rather are complementary parts of the larger value orientation of the individual. As a result of clarification of the nature of value orientations, it became necessary to alter the phrasing of the initial hypotheses. The measure of personal orientation that was eventually incorporated into the hypotheses and the preceding data analysis allowed the possibility that farm operators could have any combination of high or low levels of business and social orientations. Despite the evolution of the hypotheses during the study, the initial objectives remained constant throughout the project.

Personal orientation was found to be related to a number of personal and farm firm characteristics. The amount of managerial considerations exhibited in the decision making process was also found to be related to a farm operators personal orientation combination. Those farm operators who had a combination of high social and business orientations tended to exhibit more managerial considerations in their decision-making processes.

As presented earlier, the dynamic nature of the decision-making process presents difficulties in the quantification of decision-making. Given the constraints of a study of this nature, it was impossible to measure decision-making in a manner that capsulated the entire process. The measure adopted, the amount of managerial considerations exhibited in the decision-making process, was implemented to provide an indication of some of the processes that may, or may not, occur during a decision. To a certain extent, the fact that the process itself was not measured, there is a limit on the

ability of this study to generalize about the aggregate decision-making process. In order to effectively study the actual process by which a decision is made, an in-depth quantitative interview process is highly recommended.

Endnotes

1. L. Burchinal, "The Issues in Farm Goals and Values," in *Farm Goals in Conflict*, ed. by Iowa State University Center for Agricultural and Economic Development (Ames: Iowa State University Press, 1963), p. 9.

2. F. Petrini, "Changes in Goals and Values," *Sociologia Ruralis* 4 (1964), p. 273.

3. Economic and non-economic goals are referred to as business and social goals, respectively, in this study.

4. Marty Strange, *Family Farming: A New Economic Vision* (Lincoln: University of Nebraska Press, 1988), p. 174.

5. J.W. Bennett, "Management Style: A Concept and a Method for the Analysis of Family-Operated Agricultural Enterprise," in *Agricultural Decision Making: Anthropological Contributions to Rural Development*, ed. by Peggy F. Barlett (New York: Academic Press, 1980).

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APPENDIX A

University of Alberta
Edmonton
Canada T6G 2H1

Department of Rural Economy
Faculty of Agriculture and Forestry
515 General Services Building, Telephone (403) 432-4225

March 1989

Dear Farm Operator:

The University of Alberta is conducting a study on farm managment decision making. We feel that in times of economic instability, such as is currently being experienced by farm operators in Alberta, farm management decisions are of great importance. This study is being undertaken to understand how farm operators arrive at their decisions, what factors influence these decisions, and to determine what you feel would help improve farm management decision making.

Your farm household is one of a small number of households in your region in which people are being asked to participate in this study. In order that the results will truly represent farm operators in Alberta, it is important that each questionnaire be completed and returned. It is also important that all of the individuals who participate in making farm management decisions on your farm take part in the study.

In order to assure confidentiality, a random sample of Alberta farms was obtained from Statistics Canada with the cooperation of Alberta Agriculture.

If you would like to receive a copy of the final results of this study, please write "Copy of Results Requested" on the back of the return envelope, and print your name and address below it. Please do not put this information on the questionnaire itself.

If you have any questions, please do not hesitate to write or call. The telephone number is 492-4598.

We look forward to your participation and thank you for your assistance.

Sincerely,

Dhara S. Gill
Project Director

APPENDIX B

University of Alberta
Edmonton

March 31, 1989

Earlier this month, a questionnaire seeking your ideas on farm management decision making was mailed to you. Your name was drawn in a random sample of farms in your area.

Because the questionnaire was sent to only a small, but representative sample of Alberta farm operators, it is extremely important that yours also be included in the study. This is so that the results will truly represent the views of Alberta farm operators. If you have already completed and returned it please accept our sincere thanks. If you have not as yet completed the questionnaire, we would appreciate receiving your input as soon as possible.

If you did not receive the questionnaire, or it has been misplaced, please call us and we will forward another copy to you.

Sincerely,

Dhara S. Gill
Project Director
492-4598

Carol Littke
Research Assistant
492-5277

APPENDIX C

University of Alberta
Edmonton
Canada T6G 2H1

Faculty of Agriculture and Forestry
515 General Services Building, Telephone (403) 492-4225

May 5, 1989

Dear Farm Operator:

Last month we wrote to you seeking your ideas on farm management decision making. As of today we have not yet received back your questionnaire.

We have undertaken this study because we feel that in times of economic instability, such as is currently being experienced by farm operators in Alberta, farm management decisions are of great importance. This study is being undertaken to understand how farm operators arrive at their decisions, what factors influence these decisions, and to determine what you feel would help improve farm management decision making.

We are writing to you again because we feel that each questionnaire is important in making this study useful. Your name was drawn through a sampling process in which every farm in the Alberta Agriculture's Northwest Region had an equal chance of being selected. In order for the results of this study to truly represent the views of farm operators in your region, it is essential that each person in the sample return their questionnaire.

In the event that your questionnaire has been misplaced, a replacement is enclosed. If you have already returned your questionnaire, please disregard this notice.

Thank you for your time, your cooperation is greatly appreciated.

Sincerely,

Dhara S. Gill
Project Director
492-4598

Carol Littke
Research Assistant
492-5277

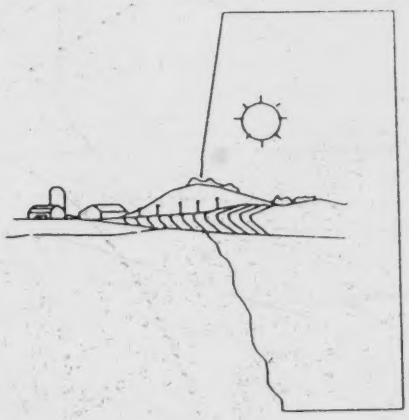
APPENDIX D

MAKING DECISIONS: A SURVEY OF ALBERTA FARM OPERATORS TO ANALYZE THE PROCESS OF MAKING FARM MANAGEMENT DECISIONS.

This survey is being done so that we can better understand what social and economic factors are important to farm operators when they make farm related decisions. Please answer all of the questions. If you wish to comment on any or qualify your answers, please feel free to use the margins. These comments will be read and taken into account in our analysis.

Thank you for your help

Department of Rural Economy
University of Alberta



Q-1 How frequently do you use the following sources to obtain farm management information (eg., prices, weather, financial information, etc.)?

(Please circle the number of the response that best describes approximately how often you consult the following sources of information)

MORE THAN ONCE A WEEK = G
ONCE A WEEK = F
ABOUT 2 TO 3 TIMES A MONTH = E
ABOUT ONCE A MONTH = D
ABOUT 2 TO 6 TIMES A YEAR = C
ABOUT ONCE A YEAR = B
NEVER = A

	A	B	C	D	E	F	G
FARM MAGAZINES/ NEWSPAPERS	A	B	C	D	E	F	G
RADIO	A	B	C	D	E	F	G
TELEVISION	A	B	C	D	E	F	G
DISTRICT AGRICULTURALISTS	A	B	C	D	E	F	G
DISTRICT HOME ECONOMISTS	A	B	C	D	E	F	G
COUNTY FIELDMEN	A	B	C	D	E	F	G
ELEVATOR AGENTS	A	B	C	D	E	F	G
FRIENDS OR NEIGHBORS	A	B	C	D	E	F	G
FARM IMPLEMENT, FEED AND SUPPLY DEALERS	A	B	C	D	E	F	G
GOVERNMENT AGRICULTURE PUBLICATIONS	A	B	C	D	E	F	G
AGRICULTURE CANADA RESEARCHERS	A	B	C	D	E	F	G
UNIVERSITY OR COLLEGE RESEARCHERS	A	B	C	D	E	F	G
COMMODITIES BROKERS/ STOCK BROKERS	A	B	C	D	E	F	G
LAWYERS	A	B	C	D	E	F	G
BANK OR LENDING AGENCY PERSONNEL	A	B	C	D	E	F	G

2

MORE THAN ONCE A WEEK = G
ONCE A WEEK = F
ABOUT 2 TO 3 TIMES A MONTH = E
ABOUT ONCE A MONTH = D
ABOUT 2 TO 6 TIMES A YEAR = C
ABOUT ONCE A YEAR = B
NEVER = A

TAX ADVISORS (ACCOUNTANT, CONSULTANT).....	A	B	C	D	E	F	G
OTHER (Please Specify)							
_____	A	B	C	D	E	F	G
_____	A	B	C	D	E	F	G

Q-2 Now we would like to ask you about your farm.

A. How many years has your farm been operated by members of your family (including previous generations)? _____ YEARS

B. How many years have you been farming? _____ YEARS

C. How many generations of your family are living and working on your farm at this time? _____

Q-3 Next, we would like to ask about how you decided what major crops to plant in the 1988 growing season.

A. How much of your land, that was used for raising crops, was planted to the following crop(s) in 1988?

(Please write the number of acres that were used for each of the following crops)

1. OATS	_____ Acres
2. BARLEY	_____ Acres
3. CANOLA (RAPESEED)	_____ Acres
4. WHEAT	_____ Acres
5. RYE	_____ Acres
6. FLAXSEED	_____ Acres
7. SUMMERFALLOW	_____ Acres
8. PASTURE	_____ Acres
9. OTHER (PLEASE SPECIFY)	
_____	_____ Acres
_____	_____ Acres
TOTAL	_____ Acres

B. In relation to your choice of the overall cropping program discussed above, please indicate how important the following considerations were.

(Circle the response that best describes how you feel, ranging from 1, Not Important At All to 5, Very Important)

	NOT IMPORTANT AT ALL				VERY IMPORTANT
A. Current crop prices	1	2	3	4	5
B. Availability of transportation	1	2	3	4	5
C. Opportunities available for marketing that crop	1	2	3	4	5
D. Soil characteristics	1	2	3	4	5
E. Weed and disease problems	1	2	3	4	5
F. Spring soil moisture conditions	1	2	3	4	5
G. Length of the growing season in your area	1	2	3	4	5
H. Average amount of rainfall in your area	1	2	3	4	5
I. Past personal experience with these crops	1	2	3	4	5
J. Past experiences of neighbors with these crops	1	2	3	4	5

C. Now, we would like you to choose the three most important considerations from the list above.

(Write the letters of the three most important considerations in the blank spaces beside the rank ordering)

1. MOST IMPORTANT _____
2. SECOND MOST IMPORTANT _____
3. THIRD MOST IMPORTANT _____

D. How did you decide how much fertilizer to apply on your crops last year?

(Circle as many as apply)

1. NONE APPLIED
2. SOIL TEST
3. USED RECORDS OF PREVIOUS APPLICATION AND COMPUTED YIELD RESPONSE TO FERTILIZER
4. GENERAL EXPERIENCE
5. FERTILIZER DEALER RECOMMENDED AMOUNT
6. FAMILY OR NEIGHBOR SUGGESTED AMOUNT
7. APPLIED THE SAME AS LAST YEAR
8. APPLIED AS MUCH AS FINANCES WOULD ALLOW
9. OTHER (Please Specify) _____

_____

E. Have you ever used a soil test?

1. YES → F. How often do you perform a soil test?
2. NO

1. MORE THAN ONCE PER YEAR
2. ONCE PER YEAR
3. ONCE EVERY TWO YEARS
4. ONCE EVERY THREE YEARS
5. OTHER (PLEASE SPECIFY)

_____

G. Do you calculate the profit from your major crop or livestock enterprise?

1. YES → H. How often do you calculate profit from your major crop or livestock enterprise?
2. NO

1. MORE THAN ONCE PER YEAR
2. ONCE PER YEAR
3. ONCE EVERY TWO YEARS
4. ONCE EVERY THREE YEARS
5. OTHER (PLEASE SPECIFY)

_____

Q-4 Now, we would like to ask you about decisions related to capital assets.

A. When did you last consider the purchase or lease of a capital asset (land, building, or equipment)?

(Report only the most recent one, and circle the appropriate number)

1. 1989
2. 1988
3. 1987
4. 1986
5. OTHER (Please Specify)_____

B. What conditions or situations first made you realize that you needed a capital asset of this kind?

(Circle all those that apply)

1. MY OPERATION EXPANDED (Crops, acres or livestock)
2. NEW ASSET WOULD MAKE MY OPERATION MORE EFFICIENT
3. FORCED INTO ACQUIRING A NEW ONE (EG. OLD ONE NOT SUFFICIENT ANYMORE)
4. NEIGHBOR HAD A SIMILAR ASSET
5. INCOME TAX CONSIDERATION
6. TIME FOR REGULAR TRADE OR PURCHASE
7. NO PARTICULAR REASON
8. OTHER (Please Specify) _____

_____

C. Which of the following helped you make this decision?

(Circle all those that apply)

1. URGENT SITUATION (LIKE A BREAKDOWN)
2. ESTIMATING OF COSTS AND BENEFITS
3. A PAYBACK ANALYSIS
4. FORMAL PARTIAL BUDGET
5. A NET PRESENT VALUE CALCULATION
6. APPROVAL FOR FINANCING FROM BANK OR FINANCE COMPANY
7. INCOME TAX CONSIDERATION
8. OTHER (Please Specify)_____

_____

Q-5 Now, we would like to ask about the kinds of financial records that you keep.

(Circle the number of the response that applies)

1. NO FINANCIAL RECORDS KEPT
2. BILLS AND RECEIPTS KEPT
3. SINGLE ENTRY RECORD
   (AS IN PRAIRIE PROVINCES FARM ACCOUNT BOOK)
4. DOUBLE ENTRY LEDGER
5. OTHER (PLEASE SPECIFY) _____

_____

Q-6 Do you keep your farm financial records on a microcomputer?

1. YES
2. NO

Q-7 What do you use your financial records for?

(Circle as many as apply)

1. NO PURPOSE, NOT USED
2. USED FOR INCOME TAX COMPLETION
3. USED FOR APPLYING FOR LOANS
4. USED FOR APPLYING FOR GOVERNMENT PROGRAMS
5. USED FOR PLANNING NEXT YEARS' OPERATION
6. USED FOR ESTIMATION OF LOSS OR PROFIT
7. USED FOR EVALUATING MY FARM OPERATION OVER THE LONGER TERM
8. TO DETERMINE WHICH PART OF THE ENTERPRISE MAKES THE MOST PROFIT
9. OTHER (PLEASE SPECIFY) _____

_____

7

Q-8 Another major part of understanding what is important to farm operators is to learn more about the kinds of organizations people are involved in. Could you please tell us which social or farm related organizations you or anyone in your family belong to.

(Please indicate your level of involvement by placing a check mark in the appropriate blank spaces beside the organizations that you belong to)

	HOLD MEMBERSHIP	HOLD OFFICE AT PRESENT	HELD OFFICE IN PAST	ATTEND REGULARLY (RARELY MISS A MEETING)
1. UNIFARM	___	___	___	___
2. UFA COOPERATIVE	___	___	___	___
3. CATTLEMENS' ASSOCIATION	___	___	___	___
4. PORK MARKETING BOARD	___	___	___	___
5. BARLEY GROWERS ASSOCIATION	___	___	___	___
6. WOMEN OF UNIFARM	___	___	___	___
7. ALBERTA WHEAT POOL	___	___	___	___
8. UNITED GRAIN GROWERS LTD.	___	___	___	___
9. NATIONAL FARMERS UNION	___	___	___	___
10. CHRISTIAN FARMERS FEDERATION	___	___	___	___
11. ALBERTA DAIRY POOL	___	___	___	___
12. ALBERTA WOMEN'S INSTITUTE	___	___	___	___
13. AGRICULTURAL SOCIETY	___	___	___	___
14. 4 H	___	___	___	___
15. COMMUNITY ASSOCIATION	___	___	___	___
16. CHURCH GROUP	___	___	___	___
17. COMMODITY GROUP (Please Specify)				
_____	___	___	___	___
_____	___	___	___	___
_____	___	___	___	___
18. OTHER (Please specify any other organizations that you or anyone else in your family belong to)				
_____	___	___	___	___
_____	___	___	___	___
_____	___	___	___	___
_____	___	___	___	___

8

Q-9 Another important purpose of this study is to learn more about the kinds of goals that are important to farm operators. The following list of goals are some that are commonly expressed by farmers. Please indicate whether you disagree or agree with each one of the statements.

(Circle the response that best describes how you feel, ranging from 1, Strongly Disagree to 5, Strongly Agree)

	STRONGLY DISAGREE				STRONGLY AGREE
A. One of my major goals is to operate a farm business that will pay a wage similar to any other business.	1	2	3	4	5
B. It is very important to me to make profitable investments in my farm business by using borrowed money.	1	2	3	4	5
C. A major goal for me is to have my net worth increase from year to year.	1	2	3	4	5
D. A major concern of mine is to have a modern farm business that will give a return on investment comparable to any other business.	1	2	3	4	5
E. It is very important to me that the farm stay in the family for at least the next generation.	1	2	3	4	5
F. One of my main reasons for farming is to be able to provide a healthy lifestyle for my family.	1	2	3	4	5
G. It is important to me to be recognized as a top farmer in my area.	1	2	3	4	5
H. A major goal of mine is to have time available to spend in leisure activities.	1	2	3	4	5

Q-10 Now, from the list above we would like you to choose the <u>three</u> goals that are the most important to you at this time.

(Write the letters of the three most important goals in the blank spaces beside the rank ordering)

1. MOST IMPORTANT _____
2. SECOND MOST IMPORTANT _____
3. THIRD MOST IMPORTANT _____

Q-11 Our next concern is about the kind of risk that farm operators feel comfortable with.

(Circle the response that best describes how you feel, ranging from 1, Strongly Disagree to 5, Strongly Agree)

	STRONGLY DISAGREE				STRONGLY AGREE
A. I would rather stay with a proven practice than switch to a new one even if the new one looks more profitable.	1	2	3	4	5
B. I tend to take more financial risks in my farming operation than do most other farmers in my community.	1	2	3	4	5
C. Even if I might be able to make more money by specializing, I would rather diversify my operation to reduce risk than specialize in one area.	1	2	3	4	5
D. I tend to try new farming practices before my neighbors do.	1	2	3	4	5
E. Even if a speculative stock paid better, I would still rather invest my money in a savings account.	1	2	3	4	5

Now, we would like to ask a few questions about yourself for statistical purposes.

Q-12 Are you currently married?

1. YES → **Q-13 Who is considered the farm operator in this family?**
   1. HUSBAND
   2. WIFE
   3. BOTH
2. NO

10

Q-14 In the next group of questions, we are interested in finding out about the farm operator and spouse (if married). If the farm operator is not married, do not complete the responses under Spouse.

A. What is your highest level of education?

(Circle the number of the appropriate response)

Farm Operator		Spouse	
1	NO FORMAL EDUCATION	1	NO FORMAL EDUCATION
2	GRADES 1 - 6	2	GRADES 1 - 6
3	GRADES 7 - 9	3	GRADES 7 - 9
4	SOME HIGH SCHOOL	4	SOME HIGH SCHOOL
5	COMPLETED HIGH SCHOOL	5	COMPLETED HIGH SCHOOL
6	SOME COLLEGE	6	SOME COLLEGE
7	COMPLETED COLLEGE	7	COMPLETED COLLEGE
8	SOME UNIVERSITY	8	SOME UNIVERSITY
9	COMPLETED UNIVERSITY	9	COMPLETED UNIVERSITY

B. What is your age as of January 1989?

Farm Operator: _____YEARS

Spouse: _____YEARS

Q-15 How many children do you have in each of the following age groups? (If none write "0")

NUMBER OF CHILDREN

_____ UNDER 5 YEARS OF AGE

_____ 5 TO 13 YEARS

_____ 14 TO 18 YEARS

_____ 19 TO 24 YEARS

_____ 25 AND OVER

Q-16 Could you please tell us the total number of days that you and/or your spouse worked off the farm for pay in 1988?

If the farm operator is not married do not complete the section under "Spouse".
(Circle the number of the response that applies)

Operator	Spouse
1. LESS THAN ONE WEEK	1. LESS THAN ONE WEEK
2. BETWEEN 2 AND 3 WEEKS	2. BETWEEN 2 AND 3 WEEKS
3. ONE MONTH	3. ONE MONTH
4. BETWEEN 2 AND 6 MONTHS	4. BETWEEN 2 AND 6 MONTHS
5. BETWEEN 7 AND 11 MONTHS	5. BETWEEN 7 AND 11 MONTHS
6. ALL YEAR	6. ALL YEAR

Q-17 What is the approximate percentage of your gross income that comes from off farm employment?

_____ percent

Q-18 Which of the following categories best describes your total GROSS SALES of all agricultural products from your farm for 1988?

1. UNDER $2,500
2. BETWEEN $2,500 AND $9,999
3. BETWEEN $10,000 AND $24,999
4. BETWEEN $25,000 AND $49,999
5. BETWEEN $50,000 AND $99,999
6. BETWEEN $100,000 AND $249,999
7. BETWEEN $250,000 AND $499,999
8. $500,000 AND OVER

Q-19 Approximately how many acres of land do you farm?

(Please write the number of acres in the appropriate blanks)

1. I OWN	_____ ACRES
2. I LEASE OR RENT	_____ ACRES
TOTAL	_____ ACRES

Q-20 Now we are interested in your major operation type in 1988.

(Please circle the number of the response that applies and write the number of acres or livestock in the blank space beside)

CULTIVATED LAND- 1988

1. BARLEY _____ acres
2. WHEAT _____ acres
3. OATS _____ acres
4. OTHER GRAINS _____ acres
5. HAY AND/OR FODDER CROPS _____ acres
6. PASTURE _____ acres
7. FALLOW _____ acres
6. OILSEEDS _____ acres
7. OTHER FIELD CROPS (POTATOES, MUSTARD, PEAS, ETC.) _____ acres
8. SOD AND/OR NURSERY PRODUCTS _____ acres
9. GREENHOUSES AND/OR MUSHROOM HOUSES _____ sq. feet

LIVESTOCK- 1988

10. POULTRY _____ number of birds
11. BEEF CATTLE Cow/calf _____ units; Feeder _____ head
12. DAIRY Milk cows _____ head; Calves _____ head
13. PIGS _____ number
14. SHEEP AND/OR LAMBS _____ number
15. HORSES _____ number
16. OTHER (PLEASE SPECIFY)

_____

_____

In this section, please feel free to provide any comments or questions that you may have about the survey. All comments will be read and taken into account.

Thank you very much for filling out this questionnaire. Please return it in the envelope provided.

Return to:

Farm Decision Making Study
Statistics Branch, Alberta Agriculture
Third Floor, 7000 - 113 Street,
Edmonton, Alberta
T6H 5T6

APPENDIX E

Additional Organizations Mentioned by Respondents

Industry Related Organizations

1. ACFA
2. Alberta Teachers Association
3. Agricultural Service Board
4. Agricultural Development Committee
5. Agricultural Land Preservation Organization
6. Alberta Beekeepers Association
7. Alberta Cow Calf Association
8. Alberta Egg Marketing Board
9. Alberta Egg Producers Board
10. Alberta Farmers Union
11. Alberta Food Processors Association
12. Alberta Goat Breeders Association
13. Alberta Growers Group
14. Alberta Honey Producers Coop
15. Alberta Milk Producers
16. Alberta Morgan Horse Club
17. Alberta Quarter Horse Association
18. Alberta Simmental Association
19. Alberta Standardbred Horse Association
20. Alliance Church Benevolent Association
21. American Quarter Horse Association
22. Association of Professional Engineers and Geologists of Alberta
23. Aurora Arabian Horse Association
24. Boy Scouts
25. Breed Association
26. Brownies
27. Canadian Charolais Association
28. Canadian Equine Federation
29. Canadian Federation of Tax Consultants
30. Canadian Honeypackers Association
31. Canadian Limousin Association
32. Canadian Morgan Horse Association
33. Canadian Seed Growers Association
34. Canadian Simmental Association
35. Canadian Standardbred Association
36. Canadian Thoroughbred Horse Association
37. Canadian Trotting Association
38. Canola Growers
39. Chamber of Commerce
40. Charolais Association
41. Christian Labor Association of Canada
42. Christian Organizations
43. Community Theatre
44. Country Rose Holstein Club
45. Co-op
46. Credit Union
47. Curling Club
48. Dairy Association
49. ECWU
50. Edmonton Coop Association
51. Edmonton Potato Growers
52. Elks
53. EMPB
54. Federated Coop
55. Feed Growers Association

56. Feeders Association
57. Figure Skating Club
58. Fish and Game Association
59. Five Star Simmental Association
60. Forage Association
61. Gateway Simmental Association
62. Grey Wooded Forage Association
63. Hereford Association
64. Historical Society
65. Hockey
66. Horse Club
67. International Arabian Horse Association
68. Knights of Columbus
69. LANTA
70. Lady Lions Club
71. Leduc Coop
72. Leduc Crop Club
73. Legion
74. L.I.F.E. Board
75. Lions Club
76. Natural Gas Coop
77. Northern Alberta Dairy Producers
78. PALM
79. Parents Advisory Council
80. Parents Place
81. Parks and Recreation Advisory Board
82. Pembina Cattle Breeders Association
83. Pembina Forage Association
84. Political Organization
85. Progressive Conservative Party of Alberta
86. Pulse Growers
87. Quarter Horse Racing Association of Alberta
88. Rapeseed Growers Association
89. Rodeo Association
90. Rural Crime Watch
91. Rural Electrification Association
92. Rural Recreation Board
93. School-Parent Liaison Committee
94. Seed Cleaning Coop
95. Seniors Club
96. Square Dancing
97. TOPS Weight Loss Group
98. Veterinary Association
99. Volleyball
100. Voluntary Fire Association
101. Warburg Seed Coop
102. Warburg-Pembina Surface Rights Group
103. Western Canadian Wheat Growers Association
104. Western National Growers Group
105. Western Stock Growers Association
106. Wheat Growers

ZERO ORDER CORRELATIONS OF VARIABLES USED IN THE DATA ANALYSIS

Variables	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Family Cycle (1)	-0.30[a]	-0.38[a]	0.76[a]	0.77[a]	-0.13[b]	0.03	-0.07	-0.14[b]	-0.11[b]	-0.19[a]	-0.28[b]	-0.13[b]	0.08	-0.07	0.42[a]	-0.12	-0.07	-0.12[b]
Education-Operator (2)		0.41[a]	-0.39[a]	-0.30[a]	0.20[a]	0.05	0.04	0.17[a]	0.01	0.28[a]	0.03	0.13[b]	0.09	-0.11[b]	-0.32[a]	0.16[a]	-0.06	0.05
Education-Spouse (3)			-0.42[a]	-0.37[a]	0.16[b]	0.15[b]	0.07	0.06	0.05	0.24[a]	0.15[a]	-0.01	0.03	-0.04	-0.43[a]	0.11	-0.01	0.04
Age-Operator (4)				0.94[a]	-0.26[a]	-0.14[b]	-0.16[a]	-0.26[a]	-0.14[a]	-0.25[a]	-0.18[a]	-0.16[a]	0.06	0.10	0.64[a]	-0.15[a]	-0.11[b]	-0.16[a]
Age-Spouse (5)					-0.21[a]	-0.17[a]	-0.05	-0.26[a]	-0.18[a]	-0.23[a]	-0.20[a]	-0.11	0.10	0.03	0.61[a]	-0.08	-0.06	-0.14[b]
Off Farm Work-Operator (6)						0.30[a]	0.32[a]	-0.37[a]	-.29[a]	0.10	.00	-0.13[b]	-0.13[b]	-0.09	-0.37[a]	0.17[a]	-0.06	-0.01
Off Farm Work-Spouse (7)							0.15[b]	-0.18[a]	-0.15[b]	0.18[a]	-0.13[b]	-0.18[a]	-0.09	-0.18[a]	-0.23[a]	-0.05	-0.10	0.03
Income From Off Farm (8)								-0.15[a]	-0.02	0.10	-0.03	-0.09	-0.09	-0.04	-0.13[b]	0.02	0.07	0.13[b]
Gross Sales (9)									0.55[a]	0.22[a]	0.14[b]	0.42[a]	0.22[a]	0.17[a]	0.00	0.41[a]	0.25[a]	0.23[a]
Size of Farm (10)										0.15[a]	0.14[a]	0.29[a]	0.19[a]	0.17[a]	0.07	0.30[a]	0.22[a]	0.15[a]
Risk Score (11)											-0.02	0.10	0.07	-0.12[b]	-0.25[a]	0.28[a]	0.10	0.12[b]
Inherit (12)												0.16[a]	0.06	0.78	0.08	0.11	0.15[a]	0.02
Industry Organization (13)													0.33[a]	0.14[b]	0.01	0.34[a]	0.18[a]	0.17[a]
Community Organization (14)														0.13[b]	0.18[a]	0.24[a]	0.25[a]	0.07
Years of Farm in Family (15)															0.40[a]	0.14[b]	0.18[a]	0.01
Years on Current Farm (16)																0.01	0.10[b]	-0.08
Managerial Consideration Score (17)																	0.23[a]	0.31[a]
Social Orientation (18)																		0.25[a]
Business Orientation (19)																		

[a]Significant at the 0.01 level
[b]Significant at the 0.05 level